This talk will demonstrate how the quantum information entering black holes is analogous to quantum information entering a superconductor. The analogy maps the interior of a black hole to a superconductor, and the exterior of the black hole to a normal metal. We show that the metal-superconductor interface can be thought of as an event horizon: The proximity effect in superconductor-metal interfaces (where Cooper pairs tend to form in the normal metal) is analogous to electron-positron creation at the event horizon in black-holes, which gives rise to Hawking radiation. Existing ideas of preserving quantum information entering black holes – the Preskill informational mirror, and the Horowitz-Maldacena mechanism for black-hole evaporation (which necessitates a unique final state for the black-hole), can be exactly realized as quantum information swapping or transfer using Andreev reflection processes. I will present mesoscopic physics analogs to wormholes with crossed Andreev reflection – and conjecture that the BCS ground state also describes the final quantum state of a black hole.

References