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Advances in Splitting and Detecting of Entangled Electrons in Cooper Pair BONING YU, Boston Univ — A Cooper Pair Splitter is a Y-junction device composed of a superconductor stem and two Quantum-Dot-embedded normal conductor arms. It can split Cooper pairs into entangled electrons, which are essential for quantum teleportation and communication. Recent studies reported modifications of the splitter with higher efficiency, including enhancing the crossed Andreev reflection by coupling a Quantum Anomalous Hall Insulator with the superconductor; tuning the conductance levels by thermoelectric effects of the embedded QDs; regulating the voltage difference of the QDs by a bilayer grapheme and placing an Al superconductor strip at the center of an InAs nanowire with two normal metallic drains at both ends. It is still hard to detect the entangled electrons directly, but an alternative way is to measure the photons' polarization entanglement converted from the electrons. Photonic nanocavity and drive lasers are usually used.

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