



Seminar/Talk

Andreev Conductance in Disordered SF Junctions with Spin-Orbit Scattering

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We calculate the conductance of a junction between a disordered superconductor and a very strong half-metallic ferromagnet admitting electrons with only one spin projection. A usual mechanism of Andreev reflection is strongly suppressed in this case since Cooper pairs are composed of electrons with opposite spins. However, this obstacle can be overcome if we take into account spin-orbit scattering inside the superconductor. Spin-orbit scattering induces a fluctuational (zero on average) spin-triplet component of the superconducting condensate, which is enough to establish Andreev transport into a strong ferromagnet. This remarkably simple mechanism is quite versatile and can explain long-range triplet proximity effect in a number of experimental setups. One particular application of the suggested effect is to measure the spin-orbit scattering time τ_{SO} in disordered superconducting materials. The value of Andreev conductance strongly depends on the parameter τ_{SO}/h and can be noticeable even in very disordered but relatively light metals like granular aluminum.

Monday, January 27, 2025 11:30am - 12:30pm

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



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