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Proximity effects and edge properties in spin-triplet based heterostructures

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Abstract: The past decades have been marked by a growing interest in the study of the interplay between superconductivity and magnetism in heterostructures both for the potential applicative impact and because of the underlying fundamental phenomena. The physical properties of heterostructures are strongly dependent on the interface and on the nature of its electronic states at the cross-talk region especially when considering unconventional superconductors [1,2].

In this talk I will introduce the spin-triplet pairing in superconducting heterostructures and focus on various remarkable effects emerging at the interface of chiral and helical spin-triplet superconductors with ferromagnets or spin-singlet superconductors: i) spin-orbital coupling emerges at the interface with an itinerant ferromagnet (FM) [1,2], ii) the occurrence of magnetic Andreev states at their edge if the system allows for mixed parity and singlet pairing [3,4], and iii) the control of spin- and charge currents at the interface between helical spin-triplet and ferromagnets [5].

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