

凝縮系物理学ゼミナール

日時：10月13日（水）13：30～

場所：理学部5号館 413号室

講演者: Prof. Ilya Vekhter 氏
(ルイジアナ大学、現在東大物性研客員教授)

「Spin properties of the surfaces of non-centrosymmetric superconductors」

I will report on the investigations of the properties of surfaces and interfaces containing noncentrosymmetric superconductors. After introducing the main features of non-centrosymmetric materials I will begin by determining the spectrum of Andreev bound states near the edge of such a superconductor due to surface-induced mixing of bands with opposite spin helicities for a Rashba-type spin-orbit coupling. Importantly, I will show that the order parameter suppression near the surface qualitatively changes the bound state spectrum, leading to a peak in the density of states at a finite energy inside the gap. I will also explain the formalism for determining the surface density of states using the quasiclassical equations, and show that the absence of inversion symmetry leads to a spin supercurrent along the interface. I will discuss implications of this result and outline the differences between weak and strong spin-orbit splitting cases.