

物理教室  
物性コロキウム

日時： 7月16日(金) 16:00 - 17:30

場所： 理学部 総合研究棟 745号室(大学院講義室)

講師： I. Affleck (University of British Columbia)

題目： Flux pinning by a line defect in a superconductor:  
a Luttinger liquid in disguise

要旨： I will discuss the effect of a line defect (columnar pin) on thermally fluctuating vortices in a superconductor. This can be mapped into a model of quantum bosons interacting with each other and with a static defect. When the applied magnetic field is tilted relative to the direction of the columnar pin the corresponding quantum Hamiltonian becomes non-Hermitian, leading to novel physical behavior. I will focus on the case of a two-dimensional superconducting sample, such as a thin platelet, where the corresponding quantum boson problem is in one space and one time direction. This quantum model then corresponds to a Tomonaga-Luttinger Liquid (TLL) with a point defect and much progress can be made using earlier results on this system. However, novel phenomena occur when the field is tilted and the TLL becomes non-Hermitian, resulting physically from a competition between the tendency of vortices to be parallel to the magnetic field and parallel to the columnar pin. I will also mention possible experimental tests of this theory which would allow observation of TLL behavior in a superconductor at temperatures near  $T_c$ .

連絡先： 坂井 徹 (217-6440)

15:45 よりコーヒー、紅茶、お菓子を用意します。

世話人： 高橋 隆 (217-6417) 中島龍也 (217-6441)  
松井広志 (217-6604) 内田就也 (217-7756)