平成 27 年 2 月 12 日
応用物理学会北海道支部
会員各位

応用物理学会北海道支部講演会のお知らせ

下記講演会を開催いたしますので、多数ご参加下さいますようご案内申し上げます。

演題：High-Mobility Electrons, Superconductivity, and Spin-Orbit Coupling in Delta-Doped $SrTiO_3$
講師：金民祐 / Minu Kim
（ソウル大学，ポストドクトラルフェロー）
日時：平成 27 年 2 月 20 日（金）　16:00～18:00
場所：北海道大学 工学部 物理工学系大会議室（A1-17）
共催：応用物理学会北海道支部（共催団体：エンレイソウの会）

講演の要旨

d-electron systems exhibit versatile and exciting physical phenomena, which can be employed to study novel electronic properties in low dimensions. Perhaps the most well known material is $SrTiO_3$ (STO), not only as a building block of complex oxide heterostructures [1], but also as a high-mobility d0-electron semiconductor, and a superconductor with the lowest known carrier density. Using thin-film growth techniques, we have fabricated “delta-doped” STO structures that confine the superconducting Cooper pairs in 2D without surface or interface scattering. Crucially these samples simultaneously show quantum oscillations that demonstrate the presence of 2D electron states [2]. More recently, we have found unconventional spin properties in these samples, revealed by the robustness of the superconductivity to parallel magnetic fields [3]. Furthermore, by increasing the mobility, we have investigated in detail the crossover of the electronic structure from 3D to 2D [4]. These results can provide an ideal system to investigate quantum phase transitions into a variety of ground states, and novel superconductivity in the

2D clean limit.

[1] A. Ohtomo & H. Y. Hwang, Nature 427, 423 (2006).
[2] Y. Kozuka et al., Nature 462, 487 (2009).
[3] M. Kim et al., Phys. Rev. B 86, 085121 (2012).
[4] M. Kim et al., Phys. Rev. Lett. 107, 106801 (2011).

なお、講演は日本語で行います。

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