Title: Interface enhanced superconductivity at 2D limit and potential to topological superconductivity in 3D Dirac semimetal

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Time: 4:00pm, Wednesday, May 6, 2015
(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: Conference Hall 322, Science Building, Tsinghua University

Abstract

By direct transport and magnetic measurements, we provide first direct evidence for high temperature superconductivity in the one unit cell (1-UC) FeSe films on insulating STO substrates with the onset Tc and critical current density much higher than those for bulk FeSe. This work may pave the way to enhancing and tailoring superconductivity by interface engineering. [1-3] Furthermore, by both in situ scanning tunneling microscopy/spectroscopy and ex situ transport and magnetization measurements, we find that the two-atomic-layer Ga film with graphene-like structure on wide band-gap semiconductor GaN is superconducting with Tc up to 5.4 K. This work offers a new platform to study two-dimensional (2D) superconductivity in metal-semiconductor heterostructures. [4] In addition, we firstly observe the superconductivity in crystalline 3D Dirac semimetal Cd3As2 with some signatures showing the possibility of topological superconductivity. [5,6]

References
[3] Scientific Reports 4, 6040 (2014);