THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics

SEMINAR

High Quality Single Crystal Growth of UTe_2 and Anomalous Superconducting and Normal State Properties

by

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Date: November 10, 2023 (Friday)
Time: 10:30 - 11:30 a.m.
Place: Rm G25, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME
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Abstract

UTe_2 is regarded as a promising candidate for a spin-triplet superconductor.[1] Its proximity to magnetically ordered phase and a field-induced metamagnetism suggest that magnetic fluctuation plays main role in occurrence of superconductivity [2,3]. On the other hand, there have been several contradicting experimental results. Splitting of the superconducting transition as well as residual density of states at T=0 are considered to be signatures for multiple superconducting order parameters, but still under debate. [1,4]

We report a growth of extremely high quality crystals of UTe_2 using the molten-salt flux technique [5]. The residual resistivity ratio as an indicator of quality reaches 1000 and the superconducting transition temperature increases from 1.5 K of the first report to 2.1 K. In this talk, details of the crystal growth and consequences from measurements using high quality samples will be discussed.

[1] Ran *et al*., Science **365**, 684 (2019).
[2] Braithwaite *et al*., Commun. Phys. **2**, 147 (2019).
[3] Miyake *et al*., J. Phys. Soc. Jpn. **88**, 063706 (2019).
[4] Hayes *et al*., Science **373**, 797 (2021)
[5] Sakai *et al*., Phys. Rev. Materials **6**, 073401 (2022).

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