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Ming Hsieh Department of Electrical and Computer Engineering

Ming Hsieh Institute **Seminar Series**

Photonics

A tunable charge density wave in the kagome metal ScV_6Sn_6

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Date: Thursday, July 18th, 2024
Time: 2:00pm – 3:30pm
In-person: EEB 248

Abstract: ScV_6Sn_6 is a newly discovered vanadium kagome metal which hosts a charge density wave (CDW) below a temperature of 92 K. I will present detailed electrical transport results on ScV_6Sn_6 and its isostructural counterpart, LuV_6Sn_66, which lacks CDW order. By comparing the electrical properties of these two materials, several important features about the CDW state that forms in ScV_6Sn_6 are unraveled. Three points stand out from the comparison between the Sc and Lu compounds. First, applying a magnetic field to ScV_6Sn_6 changes the resistivity vs temperature from metal-like to insulator-like. Next, a observe behavior akin to the anomalous Hall effect in the CDW phase of ScV_6Sn_6 is seen even without magnetic order. Lastly, the temperature dependence of the resistivity scales as $T^{3/5}$ in ScV_6Sn_6, KV_3Sb_5, RbV_3Sb_5, and CsV_3Sb_5, suggesting that this sublinear behavior is universal among the vanadium kagome compounds which exhibit CDW. By contrast, resistivity in the non-CDW compound LuV_6Sn_6 has a linear temperature dependence in the same temperature region.

Biography: Shirin Mozaffari is a Post-Doctoral Research Associate at the University of Tennessee, Knoxville. She works at the group of Prof. David Mandrus at the Materials Science and Engineering Department. Shirin synthesizes single crystals of quantum materials and studies the electronic and magnetic properties of them by methods such as magnetotransport and torque magnetometry.

Hosted by: Mercedeh Khajavikhan