UNL Department of Physics and Astronomy presents:

Probing and Engineering 2D Magnetism in Magnetic Atomic Crystals

PRESENTED BY
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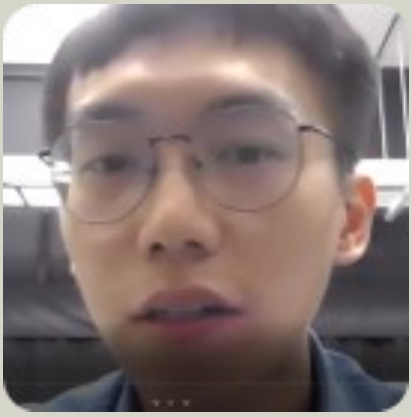

THURSDAY
MARCH 10
4:00 PM
IN JH 136

Refreshments will be served in the JH 1st Floor Vending Area at 3:30

ABSTRACT

Manipulating spin degree of freedom (DoF) is essential in addressing outstanding questions in both fundamental research in magnetism and technical revolutions for modern electronics. The recent discovery of two-dimensional (2D) magnetic atomic crystals offers a new avenue to explore the control of spin DoF using a variety of external stimuli. One key knowledge learnt is that the stacking symmetry between adjacent layers determines the interlayer magnetic coupling in naturally exfoliated 2D magnets. This naturally stimulates the interest and quest of engineering 2D magnetism using lattice DoF, in both the uniform and the periodically modulated manners. In this talk, I will focus on our recent effort and progresses on detecting and designing spin configurations in 2D structures through lattice DoF. I will first present our results on detecting and controlling of magnetic states in mechanical resonators made of 2D magnets [1]. Our finding here opens up exciting opportunities for mechanical detection of emerging magnetic states and phase transitions in 2D. Following this, I will further describe our recent success on moiré engineering of 2D magnetism by twisting two layered antiferromagnets [2,3]. Our results demonstrate the unprecedented opportunities of designing spin textures at the moiré length scale.

References

[1] S. Jiang*, H. Xie* et al., Nature Materials 19, 1295-1299 (2020).

[2] H. Xie* et al., Nature Physics 18, 30-36 (2022).

[3] H. Xie* et al., in preparation (2022).