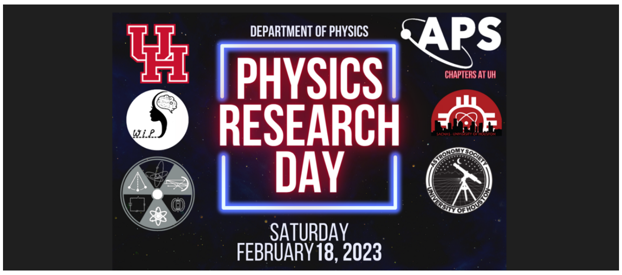

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Investigating the Magnetic Ordering and Atomic Structure of Strained CrSBr by Neutron Diffraction

Saturday 18 February 2023 12:40 (5 minutes)

Since the discovery of graphene, two-dimensional (2D) materials have sparked great interest among condensed matter physicists. These materials exhibit new physical properties, and their magnetic versions promise numerous applications for spintronics, optoelectronic devices, and quantum computing hardware. 2D magnets are attractive, but the van der Waals (VdW) form has exhibited new and exotic effects. One example is Chromium Sulphur Bromide (CrSBr), which is multi-functional and air-stable among magnetic 2D magnets. The recent discovery of 2D VdW magnets provides a new platform for manipulating magnetic properties with versatile methods to control, including electric and nanomechanical means. Strain ε engineering is a practical approach to tuning fundamental properties of 2D materials. Examples include the strain control of nematic, superconducting, and topological phases by modifying a given crystal's lattice constant and symmetry. Strain can also influence the magnon's VdW magnets. Strain has been shown to change the lattice structure and affect the exchange interaction between magnetic ions, leading to changes in the magnon spectrum and the magnon density of states. Theoretical studies have suggested that strain can modify magnetic ordering and magnetic anisotropy. Our work will study the structural properties and magnetic ordering of CrSBr using neutron diffraction. These measurements will be compared to non-strained results that were previously published.

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3rd year

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