

**Title:** Low Symmetry Van der Waals Photonic Materials

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**Abstract:** In this talk, I will discuss our fundamental research in low symmetry semiconductor materials. I will discuss our work in studying low symmetry materials such as black phosphorus and perovskites chalcogenides. Their unique optical properties resulting from their low symmetry crystal lattice will be discussed. I will also discuss our recent work in studying the interesting mechanical properties of inorganic double helical crystal material SnIP, discovering its record low Young's modulus and high mechanical flexibility.

The talk will be based on our research work published in the following papers.

1. J. Wu, et al. "Polymer-like Inorganic Double Helical Van Der Waals Semiconductor" Nano Letters, 22, 9054, 2022.
2. J. Wu, et. al. "High tunnelling electroresistance in a ferroelectric van der Waals heterojunction via giant barrier height modulation" Nature Electronics, 3, 466, 2020.
3. S. Niu, et al. "Giant optical anisotropy in a quasi-1D crystal" Nature Photonics, 12, 392, 2018.
4. J. Wu, Y. Yao, M. Lin, M. Rösner, Z. Du, K. Watanabe, T. Taniguchi, P. Tan, S. Haa, H. Wang "Spin-Phonon Coupling in Ferromagnetic Monolayer Chromium Tribromide" Advanced Materials, 34, 2108506, 2022.