

## NANO-BME Seminar

**Time: 11:00AM Tuesday, April 2**

**Location: EP208 and** <https://sdsmt.zoom.us/j/96294340132>

### Near-Field Optical Microscopy for Nanophotonics, Materials, and Device Innovation

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**Abstract:** Over the past decade, optical near-field techniques, especially scattering-type scanning near-field optical microscopy (s-SNOM), have experienced significant advancement in response to the growing demand for exploring the nano-world. The wavelength-independent spatial resolution of s-SNOM goes far beyond the fundamental diffraction limit in conventional optics, with numerous applications in material characterization throughout the fields of Physics, Chemistry, Biology, and Engineering. In this talk, I will start by introducing the study of local properties of materials via nano-imaging and nano-spectroscopy with scanning near-field optical microscopy. Furthermore, near-field optics facilitates the investigation of nanoscale light-matter interactions in the materials. One important topic is the study of confined light-matter waves, known as polaritons, in van der Waals (vdW) materials. I will present my work on developing novel strategies for tailoring polaritons in vdW materials as well as various potential applications. Finally, I will briefly talk about my work on novel electronic and optoelectronic device design and how to use my interdisciplinary expertise to advance Nanophotonics, Material Science, Device design, and beyond.

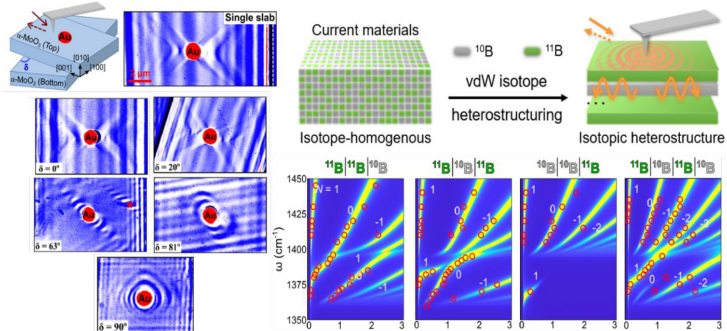


Figure 1 Engineering phonon polaritons by twisting (Left), isotope heterostructuring (Right).

**About the speaker:** Mingyuan Chen is a Postdoctoral Research Fellow in the Department of Electrical Engineering and Computer Science at the University of Michigan. He received his Ph.D. degree in Materials Engineering from Auburn University in 2023. His expertise and research interest include 2D and Emerging materials, Light-matter interaction, Nanophotonics, Near-field optics, Nanofabrication, Electronic and Optoelectronic devices, and FEM simulation. He has authored and co-authored 18 peer-reviewed papers including Nature Materials, Nature Nanotechnology, Nature Communication, Nano Letters, Advanced Optical Materials, and Small.

