



## Sub-nanometer Interface Characterization for Future Electronics

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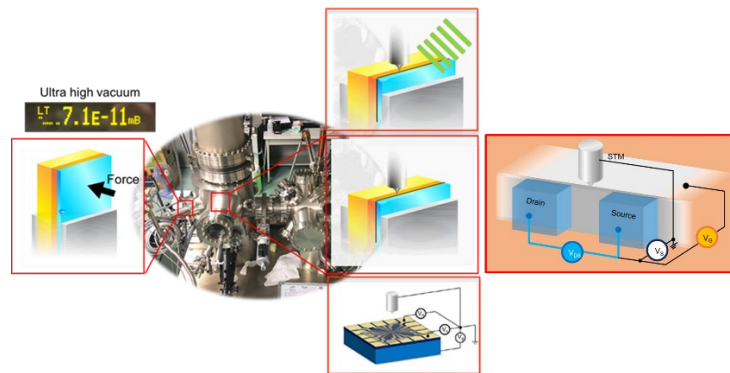
**Zoom: <https://purdue-edu.zoom.us/j/96640538773>**

### Abstract:

Interface science has recently received significant attention due to the development of state-of-the-art materials and devices that provide powerful ways to create and manipulate charge, spin, orbital, and lattice degrees of freedom at interfaces. Motivated by the fact that nanoscale interface science is critical for device applications, this talk will focus on sharing the measurement capabilities of mapping the interfacial properties of heterostructured structures using cross-sectional scanning tunneling microscopy (XSTM) and elucidating the mechanisms inherent in these materials and devices.<sup>1-6</sup>

In my lab, the establishment of the XSTM technique has provided a measurement tool for probing the electronic structure and band alignment of interfaces in cutting-edge heterostructured materials. Recently, this technique has been improved by integrating an illumination light source, which enables the observation of spatially resolved mapping images of photogenerated carriers at perovskite grains.

The platform now combines gate-, source- and drain- tunable biasing and will be used to explore the electronic structure of cutting-edge device interfaces. This will be a potential demonstration of characterization capabilities and provide critical insights into the exploration and innovation of future electronic devices.



**FIG 1:** Multi-functional Atomically Resolved Cross-Sections STM.

### Biography:

Dr. Ya-Ping Chiu is Deputy Vice President for Research and Development at National Taiwan University and Distinguished Professor at Dept. of Physics, National Taiwan University. She is a world-renowned expert in STM/Cross-sectional STM measurements (gate-tunable STM/XSTM for semiconductor devices, light-modulated STM/XSTM for optoelectronic materials), interface science, low-dimensional materials electronic structure and complex oxides. She obtained her BS and Ph.D. from National Taiwan Normal University in 1997 and 2005, respectively.