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**Local Probe Investigation of Interfaces in 2D Materials**

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Emerging two-dimensional (2D) materials, such as atomically thin transition metal dichalcogenides and graphene, have been the subject of intense research efforts for their fascinating properties and potential applications in future electronic and optical devices. The interfaces in these 2D materials, including domain boundaries, edges and heterojunctions, strongly govern the electronic and magnetic behavior and may also potentially host new quantum states. On the other hand, the interfaces are more susceptible to thermal fluctuation and external stimuli. In this talk we will present our scanning tunneling microscopy (STM) and spectroscopy (STS) explorations of edges of few layered molybdenum disulfide ($MoS_2$) nanostructures and will show how step edges on titanium diselenide ($TiSe_2$) surfaces change dynamically due to electrical fields. We will also discuss temperature evolution of quasi-1D fullerene nanostructures on graphene. Through careful control of the subtle balance between the $C_{60}$ surface mobility and the periodic potential of rippled graphene, $C_{60}$ molecules can be arranged into a novel chain structure, and this chain structure can further transition to a compact hexagonal close packed stripe structure by tuning the annealing temperature.