



演題：**Diverse applications using a two dimensional transition metal dichalcogenide alloy layer**

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要旨：Compositionally variant 2D atomic layers have attracted much interest, offering the possibility of creating a large number of electronic and sensing applications. In this seminar, two applications based on 2D TMDs will be addressed: transistor and sensor.

Firstly, we will introduce high performance transistor applications *via* approach of utilizing unique 2D TMD alloy synthesis methods. The two-dimensional WSe₂-based transistor with mixed transition layer containing van der Waals (M-vdW, NbSe₂/W_xNb_{1-x}Se₂/WSe₂) junction realizes atomically sharp interface, exhibiting the superior transistor performance. Secondly, we will show that two-dimensional (2D) metal (NbSe₂)-semiconductor (WSe₂)-based flexible, wearable, and launderable gas sensors can be prepared through simple one-step chemical vapor deposition of prepatterned WO₃ and Nb₂O₅. Compared to a control device with a Au/WSe₂ junction, gas-sensing performance of the 2D NbSe₂/WSe₂ device was significantly enhanced, which might be attributed to the formation of a Nb_xW_{1-x}Se₂ transition alloy junction lowering the Schottky barrier height.

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