

## **Magnetostructural transition of two-dimensional antiferromagnetic materials under electric field**

Wei Wang

*Department of Quantum Matter Physics, University of Geneva*

The two-dimensional layered antiferromagnetic material  $\text{MnPS}_3$  had attracted considerable attention for their significant potential application in catalysis, ultraviolet photoelectric detection and spintronics. However, compared with ferromagnetic materials, there are some limitations in application of antiferromagnetic materials. Thus, the modification of magnetic properties of  $\text{MnPS}_3$  is of great importance. Recently, theoretical calculations show that it could realize the transformation of antiferromagnetic to ferromagnetic order in  $\text{MnPS}_3$  by adjust the carrier concentration. Because it is difficult to directly detect the magnetism of  $\text{MnPS}_3$  flakes, we designed and constructed  $\text{MnPS}_3$ /graphene heterojunction to detect the magnetic structure changes of  $\text{MnPS}_3$  under various gate voltage by measuring the Hall resistance of graphene at low temperature. Through the analysis of the anomalous Hall effect, we can observe the antiferromagnetic state to ferromagnetic state transition, and identify other magnetostructural transition, such as spin-flop and spin-flip transition etc.