

# Valleytronics in the moiré of TMD heterobilayers and homobilayers

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**Wang Yao**

*Department of Physics, The University of Hong Kong, Hong Kong, China*

[wangyao@hku.hk](mailto:wangyao@hku.hk)

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## Abstract

Van der Waals stacking of the 2D semiconductors into vertical layered structures is a powerful approach towards designer quantum materials that can combine and extend the exotic properties of the building blocks. Ubiquitous to these vdW heterostructures is the formation of moiré pattern due to the inevitable lattice mismatch and twisting between the layers. In 2D semiconducting transition metal dichalcogenides where the band edge carriers are described by valley-spin locked massive Dirac fermions, we show that the moiré offers unprecedented opportunities to engineer electronic, optical and magnetic properties for valley-spintronic controls in heterobilayer [1,2] and homobilayer [3] semiconductors.

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## References

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