# Spin Transport in Graphene/2D-Ferromagnet Heterostructures

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Owing to its weak magnetism and spin-orbit coupling (SOC), graphene has proven to be an efficient carrier of spin, making it promising for spintronics applications. However, this also prevents the active manipulation or generation of spin currents. Recent work has thus focused on interfacing graphene with 2D magnetic materials in the hope of inducing ferromagnetism in graphene while maintaining its superior charge transport properties.

In this talk, I will present our recent studies of spin transport in graphene interfaced with the 2D ferromagnet $Cr_2Ge_2Te_6$ (CGT) [1,2]. Measurements of Hanle spin precession indicate perpendicular ferromagnetism induced in the graphene layer by the CGT. Theory and modelling support this observation and suggest that spin transport in these systems is limited by fluctuating exchange fields in the graphene layer. Our experimental and theoretical results open opportunities for the realization of proximity-induced magnetic interactions and spin filters in 2D material heterostructures, which can form the basic building blocks for future spintronic devices.

## References

[1] B. Karpiak, A.W. Cummings et al., 2D Mater., 7 (2020) 015026
[2] A.W. Cummings, J. Phys. Mater., 2 (2019) 045007

## Figures

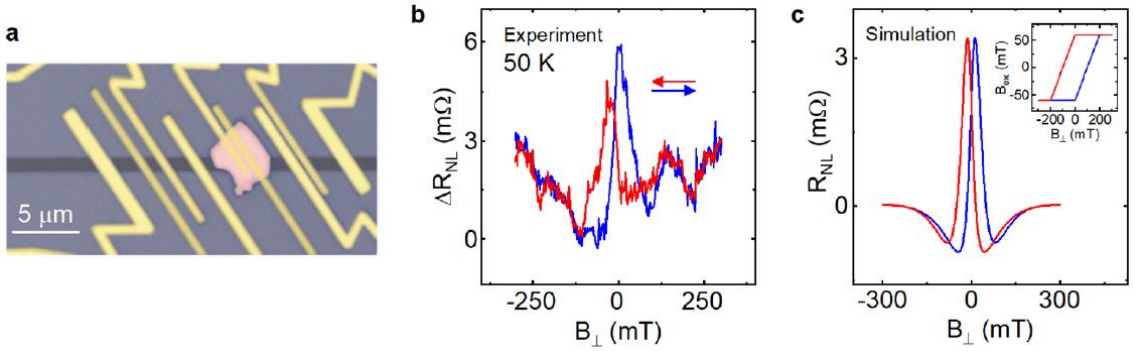


**Figure 1: a,** Optical image of a graphene/CGT nonlocal spin valve. **b,** The measured Hanle signal at 50 K, below the Curie temperature of CGT. **c,** Simulated Hanle signal for typical device parameters. Figure adapted from Ref. 1.