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(I) Quantum materials at the atomic scale

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Understanding and controlling the properties of 2D materials to our advantage can be contemplated with the development of experimental tools to probe and manipulate electrons and their interactions at the atomic scale. In this talk, I will present scanning tunnelling microscopy and spectroscopy experiments aimed at: elucidating the nature of atomic-scale defects in 2D materials [1], visualizing moiré patterns between crystals with different symmetries [2] and imaging surface and edge states in a magnetic topological system. Moreover, I will discuss how we leverage our expertise in probing and engineering electronic states at surfaces of 2D materials to further the development of graphene-based gas sensors [3] and gated quantum dot circuits based on 2D semiconductors [4].

REFERENCES

- [1] Plumadore et al., PRB, (2020)
- [2] Plumadore et al., Journal of Applied Physics, (2020)
- [3] Rautela et al., ACS Applied Materials & Interfaces (2020)
- [4] Boddison-Chouinard, Appl. Phys. Lett., (2019)

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