
Electric polarization of van der Waals crystals and their heterostructures probed on the atomic scale

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In this talk I will review our works on the study of electric polarization of van der Waals crystals and their heterostructures, which we probe directly on the atomic scale using scanning probe microscopy [1-3]. In particular, I will discuss the case of hBN (for few-layers down to monolayer crystals), and its dielectric, piezoelectric and ferroelectric properties. I will focus on our recent experiments in which we showed that stacking hBN crystals twisted at small angles, ferroelectric-like domains arranged in triangular superlattices emerge. Our results opened up new possibilities for understanding electric polarization and designing novel 2D devices with ferroelectric properties.

References

- [1] L. Fumagalli et al. *Science* 360 (2018) 1339
- [2] P. Ares et al. *Adv. Mater.* 32, (2020) 1905504
- [3] C. R. Woods et al. *Nat. Commun.* 12 (2021) 347