"Slide-Tronics"

Moshe Ben Shalom
M. Vizner Stern, Y. Wais, W. Cao, I, Nevo, E Sela, M Urbakh, O Hod, M Ben Shalom
Tel Aviv University, Israel

Contact@E-mail (Century Gothic 10)

A new ferroelectric system, only two-atoms-thick is presented [1]. Stacking two layers of hexagonal boron nitride (hBN) atop each other, with a parallel crystal orientation, results in a permanent electric polarization pointing out of the plane. Furthermore, applying an opposite external electric field switches the vertical polarization by a horizontal sliding between the layers of a full atomic spacing distance. I will describe our atomic force experiment, DFT calculations, and a simplistic cohesion model, allowing us to explore the interfacial-ferroelectricity and its unique Slide-Tronics switching mechanism.
If time allows, I will further discuss our efforts to induce intrinsic electric and magnetic gauge-fields in graphene by particular strain-engineering schemes [2].

References

[1] https://arxiv.org/abs/2010.05182
[2] https://arxiv.org/abs/1909.09991
https://www.tau.ac.il/~moshebs

Figures

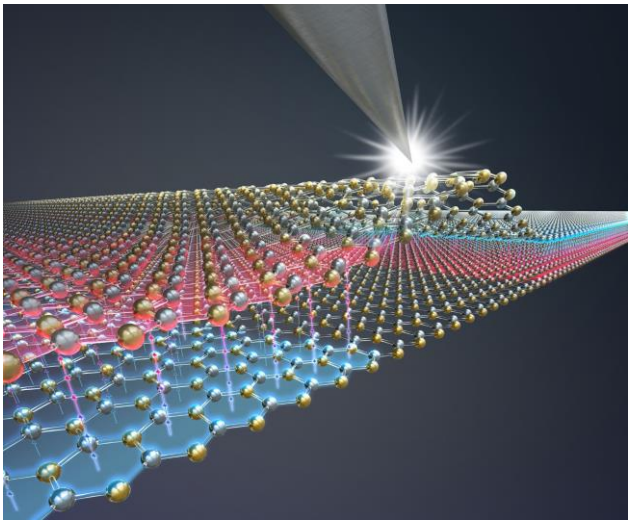

Figure 1: Interfacial ferroelectricity by Sliding

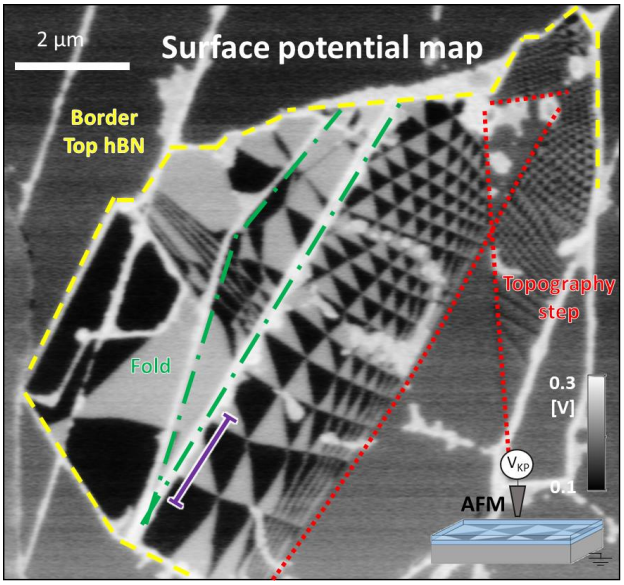

Figure 2: Surface potential map of ferroelectric domains in 3R-like hBN