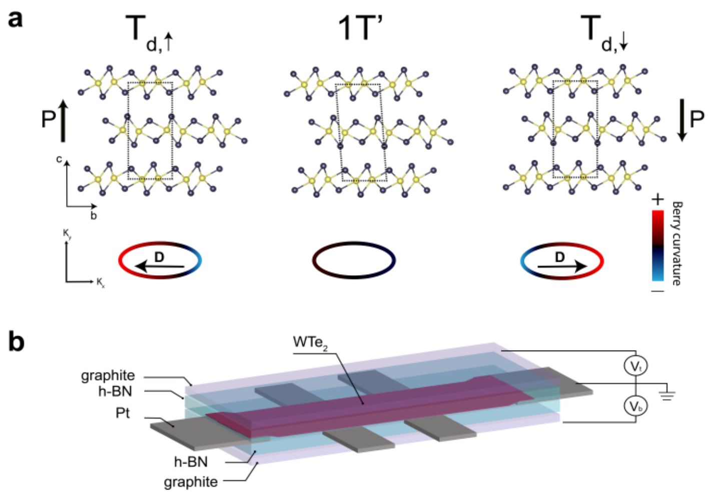

Fig. 1 Electrical control of stacking order transitions in WTe_2. a, Side view (*b*–*c* plane) of unit cell showing possible stacking orders in WTe_2 (monoclinic 1T', polar orthorhombic $T_{d,\uparrow}$ or $T_{d,\downarrow}$) and schematics of their Berry curvature distributions in momentum space. The yellow spheres refer to W atoms while the black spheres represent Te atoms. **b,** Schematic of dual-gate h-BN capped WTe_2 device.

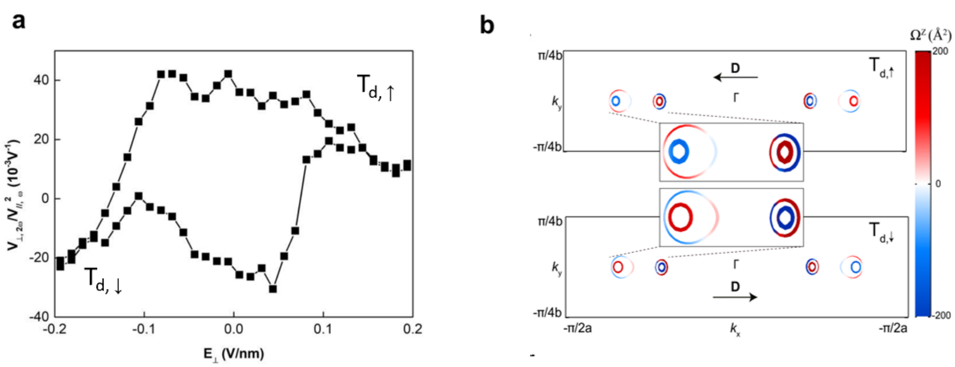

Fig. 2 Memory behavior of Berry curvature during transitions between $T_{d,\uparrow}$ and $T_{d,\downarrow}$ stacking orders. a, Electric field dependent nonlinear Hall effect (NHE) measurement in a trilayer WTe_2. The sign of NHE was observed to be reversed in the trilayer. Because NHE signal ($V_{\perp,2\omega}$ / $(V_{//,\omega})^2$) is proportional to Berry curvature dipole strength, it indicates the flipping of Berry curvature dipole only occurs in trilayer. **b,** Calculated Berry curvature Ω^z distribution in 2D Brillouin zone at the Fermi level for T_d (upper subfigure) and the corresponding flipped T_d phase (lower subfigure) in trilayer WTe_2. It confirms the change of such quantum geometrical property are locked with the stacking transition, thus enable a new type of memory with easy reading mechanism based on ferroelectric semimetals.