

## Supplementary Information

# Screening the 4f-electron spin of TbPc<sub>2</sub> on metal substrates by ligand channeling

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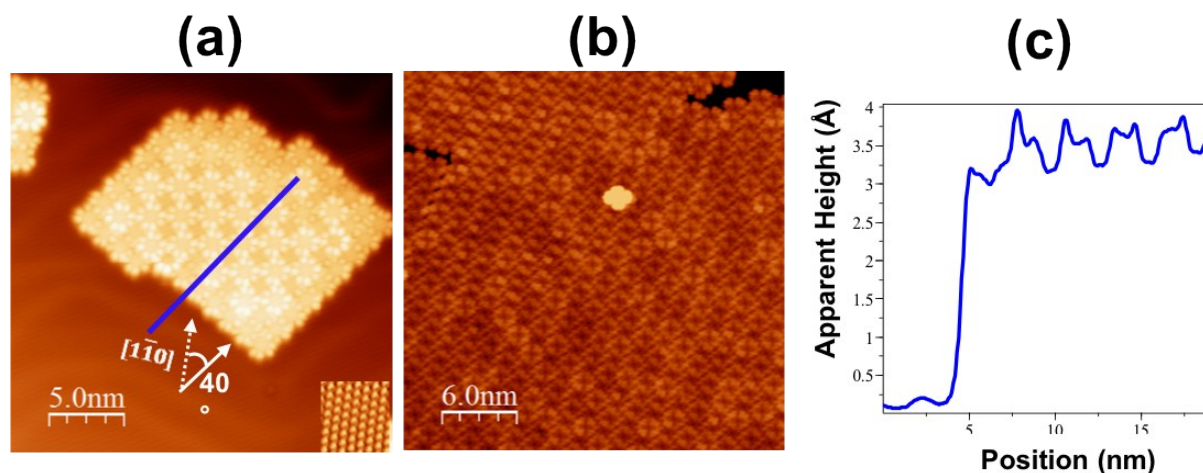
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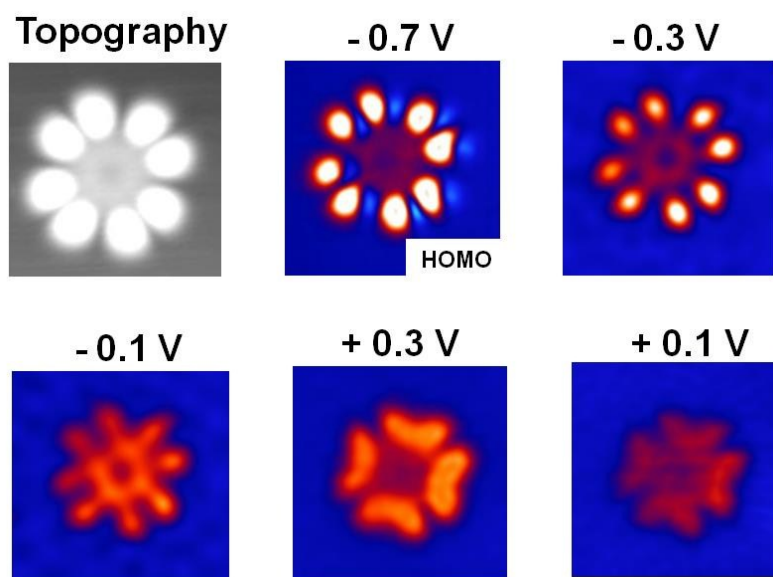
Keywords: Single molecule magnets, Kondo effect, scanning tunneling microscopy, spintronics,  
4f-electron magnetism, quantum mechanical entanglement, metal-organic interface.

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**Figure S1.** STM images of YPC<sub>2</sub> grown on Au(111). (a) Domain of Phase I ( $V_S = -1.0$  V,  $I_T = 80$  pA). The molecule orientation makes an angle of  $40^\circ$  with respect to the  $[110]$  direction of the Au substrate (inset:  $2$  nm  $\times$   $2$  nm;  $V_S = -0.2$  V,  $I_T = 100$  pA); (b) Domain of Phase II ( $V_S = -0.7$  V,  $I_T = 70$  pA). (c) Topographic line scan across the monolayer island, blue line in (a), its apparent height is  $0.35$  nm.



**Figure S2.** Constant height differential conductance maps at an isolated TbPc<sub>2</sub> molecule on Ag(111). Eight lobes are clearly visible at negative polarity, whereas a boomerang shape is obtained at positive bias. Set point parameters are:  $V_S = 0.40$  V and  $I_T = 0.70$  nA.