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Inducing electric polarization in ultrathin insulating layers JOSE MARTINEZ-CASTRO, London Center for Nanotechnology, London, MARTEN PIANTEK, Instituto de Nanociencia de Aragn and Laboratorio de Microscopas Avanzadas, Universidad de Zaragoza, MATS PERSSON, SSRC, University of Liverpool, Liverpool, DAVID SERRATE, Instituto de Nanociencia de Aragn and Laboratorio de Microscopas Avanzadas, Universidad de Zaragoza, CYRUS F. HIRJIBEHEDIN, London Center for Nanotechnology, London — Studies of ultrathin polar oxide films have attracted the interest of researchers for a long time due to their different properties compared to bulk materials. However they present several challenges such as the difficulty in the stabilization of the polar surfaces and the limited success in tailoring their properties. Moreover, recently developed Van der Waals materials have shown that the stacking of 2D-layers trigger new collective states thanks to the interaction between layers. Similarly, interface phenomena emerge in polar oxides, like induced ferroelectricity. This represents a promising way for the creation of new materials with customized properties that differ from those of the isolated layers. Here we present a new approach for the fabrication and study of atomically thin insulating films. We show that the properties of insulating polar layers of sodium chloride (NaCl) can be engineered when they are placed on top of a charge modulated template of copper nitride (Cu_2N). STM studies carried out in ultra-high vacuum and at low temperatures over NaCl/Cu2N/Cu(001) show that we are able to build up and stabilize interfaces of polar surface at the limit of one atomic layer showing new properties not present before at the atomic scale.

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