

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Quasi-long range ordered hole-adatoms pairs on SrTiO<sub>3</sub>(110)-(4×1) surface**<sup>1</sup> JIANDONG GUO, FENGMIAO LI, ZHIMING WANG, SHENG MENG, ZHIQIANG ZHANG, Institute of Physics, Chinese Academy of Sciences — The surface structure of transition metal oxides (TMOs) has been an important issue for chemistry and photocatalysis. We studied the surface of SrTiO<sub>3</sub>, which is a wide-gap semiconductor and has been believed useful for photo-induced water splitting. Specifically we focused on the (110) surface that bears intrinsic instability of reconstruction due to the surface polarity. The monophased (4×1)-reconstructed surface was obtained with the treatment of argon ion sputtering followed by annealing in ultra high vacuum. More interestingly, we observed a (4×10) quasi-long range ordered hole-adatom structure. The atomic configuration was identified by both experimentally adsorbing additional Sr atoms and density functional calculations. The ordering of the hole-adatom pairs was robust since its formation effectively released the stress on (4×1)-reconstructed SrTiO<sub>3</sub>(110) surface. Such a surface with ordered defects served as a good template for the guided growth of noble metal nanoclusters with controlled size and density.

<sup>1</sup>This work was supported by CMOST.

Jiandong Guo  
Institute of Physics, Chinese Academy of Sciences

Date submitted: 11 Nov 2011

Electronic form version 1.4