

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Epitaxial Growth of Two-Dimensional Stanene** JINFENG JIA<sup>1</sup>,  
Shanghai Jiao Tong University — Ultrathin semiconductors present various novel electronic properties. The first experimental realized two-dimensional (2D) material is graphene. Searching 2D materials with heavy elements bring the attention to Si, Ge and Sn. 2D buckled Si-based silicene was realized by molecular beam epitaxy (MBE) growth. Ge-based germanene was realized by mechanical exfoliation. Sn-based stanene has its unique properties. Stanene and its derivatives can be 2D topological insulators (TI) with a very large band gap as proposed by first-principles calculations, or can support enhanced thermoelectric performance, topological superconductivity and the near-room-temperature quantum anomalous Hall (QAH) effect. For the first time, in this work, we report a successful fabrication of 2D stanene by MBE. The atomic and electronic structures were determined by scanning tunneling microscopy (STM) and angle-resolved photoemission spectroscopy (ARPES) in combination with first-principles calculations. This work will stimulate the experimental study and exploring the future application of stanene.

<sup>1</sup>In cooperation with Fengfeng Zhu, Wei-jiong Chen, Yong Xu, Chun-lei Gao, Dandan Guan, Canhua Liu, Dong Qian, Shou-Cheng Zhang

Jinfeng Jia  
Shanghai Jiao Tong University

Date submitted: 02 Dec 2015

Electronic form version 1.4