

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Silicene on Silver: fundamental physical properties and integration in Field-Effect Transistors EUGENIO CINQUANTA, Laboratorio MDM, IMM-CNR, via C. Olivetti 2, Agrate Brianza, I-20864, Italy, LI TAO, Microelectronics Research Center, The University of Texas at Austin, Texas 78758, USA, GUIDO FRATESI, ETSF and Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy, CARLO GRAZIANETTI, MARCO FANCIULLI, Laboratorio MDM, IMM-CNR, via C. Olivetti 2, Agrate Brianza, I-20864, Italy, GIOVANNI ONIDA, ETSF and Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy, DEJI AKINWANDE, Microelectronics Research Center, The University of Texas at Austin, Texas 78758, USA, ALESSANDRO MOLLE, Laboratorio MDM, IMM-CNR, via C. Olivetti 2, Agrate Brianza, I-20864, Italy — To date, Silicene encountered different bottlenecks as reliable option in the framework of two-dimensional materials beyond graphene. Its physical properties are not completely unveiled and this, combined with its environmental instability, limits its possible integration into devices. Here we show a comprehensive characterization of Silicene by combining ab-initio calculations with optical spectroscopies. We elucidate the role of Ag in determining the electronic band structure and the optical response of differently oriented Silicene superstructures. We also show how these fundamental properties reflect in devices by presenting the experimental evidence of the ambipolar electrical transport in Silicene based field effect transistor.

Eugenio Cinquanta
Laboratorio MDM, IMM-CNR, via C. Olivetti 2,
Agrate Brianza, I-20864, Italy

Date submitted: 14 Nov 2014

Electronic form version 1.4