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Correlation induced charge ordering metal-insulator transition in a two-dimensional triangular lattice R. CORTES, Univ. Complutense de Madrid, A. TEJEDA, Institut Jean Lamour, J. LOBO-CHECA, CIN2, C. DIDIOT, B. KIERREN, D. MALTERRE, Institut Jean Lamour, J. MERINO, F. FLORES, E.G. MICHEL, Univ. Autonoma de Madrid, A. MASCARAQUE, Univ. Complutense de Madrid — Mott insulators are one of the clearest examples on how electronic correlations limit the band theory. Semiconducting surfaces offer an ideal playground to study correlation effects in two dimensions. We report here a combined experimental and theoretical analysis on correlation effects in an atomically ordered reconstruction of 1/3 ML of Sn on Ge(111). This interface exhibits a Mott metal insulator transition below 30 K [1,2]. We find a novel phase between the known metallic and insulating phases, settled by electronic correlations and characterized as a charge ordering insulator (COI) that competes with the lower temperature Mott phase. We describe here the electronic mechanism behind the stabilization of the COI-phase, the role of atomic vibrations in the process, and interpret these findings on the basis of DMFT theoretical calculations. These results explain recent controversies [3] on the interpretation of the nature of the low temperature phase. [1] A. Tejeda et al. Phys. Rev. Lett. 100 (026103) 2008 [2] R. Cortes et al. Phys. Rev. Lett. 96 (126103) 2006 [3] H. Morikawa et al. Phys. Rev. B 78 (245307), 2008; S. Colonna et al., Phys. Rev. Lett. 101 (186102) 2008

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