香 港 浸 會 大 學
HONG KONG BAPTIST UNIVERSITY
FACULTY OF SCIENCE

Department of Physics &

Department of Mathematics &

Institute of Computational and Theoretical Studies

JOINT COLLOQUIUM

Periodic Overlayers, Interference Lattices, and Moiré Patterns: a unified theoretical treatment

BY

Prof. K. Hermann
Inorg. Chemistry Dept., Fritz-Haber-Institut, Berlin (Germany)

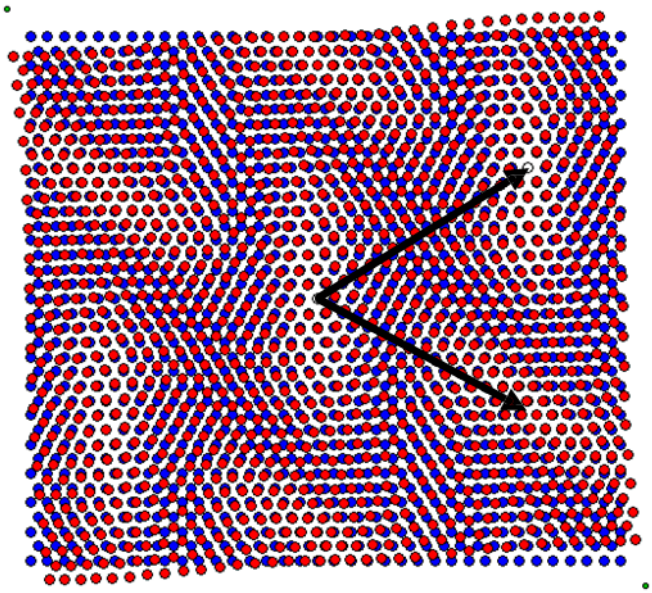
Friday, February 13, 2015
10:30am – 11:30am (Tea will be served)
SCT909, Science Tower, HSH Campus

/…2

Abstract

Complex overlayer structures at single crystal surfaces have been observed where long-range order, expressed by additional approximate surface periodicity with very large unit cells, was found. Examples are graphene at different hexagonal metal surfaces, such as Ru(0001) [1], Ir(111) [2], silver on Ni(111) [3], as well as C_{60} on Pb(111) [4] and sulfur on Ag(111) [5]. This phenomenon can be characterized by spatial interference resulting in 2-dimensionally periodic Moiré patterns. The patterns, consisting of similar local surface regions (*moirons*), are examined by Fourier analysis and (higher-order) coincidence lattice theory [6]. This provides simple mathematical relations allowing to compute 2-dimensional Moiré lattices of any order in their dependence on layer rotation and scaling with respect to a given commensurate lattice structure. The formalism will be illustrated by example systems observed in experiment.

[1] D. Martoccia, P.R. Willmott, T. Brugger, et al., Phys. Rev. Lett. 101 (2008) 126102.
[2] E. Loginova, S. Nie, K. Thürmer, et al. , Phys. Rev. B 80 (2009) 085430.
[3] C. Chambon, J. Creuze, A. Coati, et al., Phys. Rev. B 79 (2009) 125412.
[4] H.L. Li, K.J. Franke, J.I. Pascual, L.W. Bruch, R.D. Diehl, Phys. Rev. B 80 (2009) 085415.
[5] M. Yu, D.P. Woodruff, C.J. Satterley, et al., J. Phys. Chem. 111 (2007) 3152.
[6] K. Hermann, J. Phys. Cond. Matter 24 (2012) 314210.



All Interested Are Welcome!