

Abstract Submitted
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Increased structural ordering of the low temperature wetting layer in the Pb/Si(111)-7x7 system P.F. MICELI, M.W. GRAMLICH, S.T. HAYDEN, YIYAO CHEN, U. of Missouri-Columbia, C. KIM, Kyung Hee U., Korea, E.H. CONRAD, Georgia Inst. Tech., M.C. TRINGIDES, Iowa State U. — The Pb/Si(111)-7x7 system exhibits interesting quantum size effects (QSE) for Pb nano-islands, including anomalously fast island coarsening that is facilitated by the wetting layer between the islands. While it is known that the wetting layer has a disordered 8x8 structure, the exact structure of the layer is still an open question. Our in situ x-ray scattering studies show that the wetting layer structure evolves temporally over a remarkably broad range of temperatures due to *two* physically independent mechanisms. The as grown low temperature wetting layer is found to slowly anneal into a *better-ordered 8x8 structure*, which suggests that it is highly dynamic as it attempts to accommodate the large corrugation of the Si(111)7x7 substrate. This increased order has important implications for the fast atom transport between the QSE-islands. Research funding is supported by NSF DMR-0706278 and the Ministry of Knowledge Economy of Korea 2009-F014-01 (CK). The experiments were performed at the Advanced Photon Source Sector 6 beam-line at Argonne National Laboratory, which is supported by the US-DOE through Ames Lab under Contract No. W-7405-Eng-82.

Paul Miceli
U. of Missouri-Columbia

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