

Abstract Submitted  
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**Controlled Surface functionalization via self-selective metal adsorption and pattern transformation on vicinal Si(111) surface**<sup>1</sup> F.K. MEN, A.L. CHIN, Department of Physics, National Chung Cheng University, Chia-Yi 621, Taiwan, ROC, FENG LIU, Department of MSE, University of Utah, Salt Lake City, UT 84112, USA — We demonstrate a self-selective metal adsorption and pattern transformation process on vicinal Si(111) surfaces. When Au atoms are deposited onto the self-organized periodic Si(111) surface patterns, the Au atoms self-select to adsorb predominantly onto one of the two distinct domains, the Si(111) terrace or the step-bunched facet, at different Au coverage. This leads to a systematic transformation of the surface pattern, whose domain population changes while its periodicity remains intact with the increasing Au coverage. A stress-domain model is used to explain the observed phenomenon. Our findings suggest a unique method for controlled functionalization of surfaces at the nanoscale, as illustrated further by domain-selective self-assembly of uniform CoSi<sub>2</sub> nanoclusters on the Au-functionalized vicinal Si(111) surface.

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Fu-Kwo Men  
Department of Physics, National Chung Cheng University,  
Chia-Yi 621, Taiwan, Republic of China

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