

Abstract Submitted
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Magnetic Si Atoms at the Step Edges of Si(553)-Au PAUL SNIJDERS, ORNL, NATHAN GUISENGER, ANL, PHILLIP JOHNSON, UW-Madison, STEVEN ERWIN, NRL, FRANZ HIMPSEL, UW-Madison — A recent calculation predicts the possibility of magnetism at step edges of vicinal Si(111) surfaces decorated with gold [1]. Graphene-like Si ribbons are formed, which contain spin-polarized Si atoms at their edges. Those atoms form a six-fold superlattice at low temperature. Scanning tunneling spectroscopy (STS) of the magnetic broken bond orbitals reveals two peaks below 50 K. They match the calculated majority and minority spin states. The peaks merge into a single, broad peak at 300 K due to rapid spin fluctuations.

[1] Steven C. Erwin and F. J. Himpsel, Nature Communications 1:58 (2010).

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