

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Disorder and Roughening at Surfaces of Silver/Gold Alloys<sup>1</sup>** GREGORY DERRY, Loyola College In Maryland, RUNDONG WAN, University of Maryland Baltimore County — Attempts to obtain a clean and well-ordered surface in ultrahigh vacuum for several low index faces of a 50 at% silver/gold alloy gave rise to an unexpected phenomenon. After several cycles of sputtering and annealing, the surfaces appeared clean using Auger spectroscopy but yielded low energy electron diffraction spots of poor quality (in the case of AgAu(110), no diffraction was observed at all). Many further time/temperature annealing protocols were attempted with no improvement. In addition to the diffraction results, which indicate a lack of long-range microscopic order at the surface, continued processing resulted in macroscopic roughening of the surfaces. Electron microscopy revealed the presence of features with sizes on the order of microns at the roughened surfaces. Analysis of the lineshapes of the diffuse LEED beams for the AgAu(111) surface indicates that the sizes of the ordered patches on the surface are less than a nanometer. These results will be presented in more detail and possible explanations for this extraordinary behavior will be discussed.

<sup>1</sup>funded by the National Science Foundation, grant DMR-9903108

Gregory Derry  
Loyola College In Maryland

Date submitted: 22 Nov 2005

Electronic form version 1.4