

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Terrace Selection at an Icosahedral Quasicrystal Surface** BARIS UNAL, CYNTHIA JENKS, THOMAS A. LOGRASSO, AMY ROSS, PATRICIA A. THIEL, Departments of Materials Science & Engineering and of Chemistry, and the Ames Laboratory, Iowa State University, Ames, IA 50011, USA — Quasicrystals are aperiodic, but well-ordered, intermetallics. Using scanning tunneling microscopy, we investigate the effects of annealing temperature on the structure of a fivefold surface of icosahedral Al-Pd-Mn. After annealing at 900-915 K shallow void-rich terminations are created although the density of the voids are nearly zero after annealing at 925-950 K. The terminations that are consumed by voids have a distinctive atomic local configuration, very similar to “rings” identified in the model of Papadopolos and Kasner [1]. During the coalescence and the growth of the voids, a different termination becomes exposed. We suggest that the shallow steps associated with the voids, and the rings, signal a surface that is at an intermediate stage of structural equilibration. These exposed terraces give us a new insight into the structure of quasicrystal. [1] Papadopolos, Z., et al., Phys. Rev. B 66, 184207 (2002)

Baris Unal  
Department of Materials Science & Engineering, Iowa State University

Date submitted: 20 Mar 2013

Electronic form version 1.4