Meeting: 1003, Atlanta, Georgia, SS 30A, AMS Special Session on Analysis Problems in Modern Physics, I

1003-82-970 **Richard W Kenyon***, Mathematics, University of British Columbia, Vancouver, BC V6T 1Z2, Canada. *Shapes of crystalline surfaces.*

This is joint work with Andrei Okounkov. We study a model of discrete random crystalline surfaces in $\mathbb{R}^3$ arising in the planar dimer model. We derive a PDE, related to the complex Burgers equation, for the limit shapes when the lattice spacing tends to zero, and show that the resulting smooth surfaces can have facets. Remarkably, the surfaces have a natural parametrization by complex analytic functions. (Received October 01, 2004)