

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Ballistic Deposition of Nanoclusters.¹ JEFFREY ULBRANDT, YANG LI, RANDALL HEADRICK, Univ of Vermont — Nanoporous thin-films are an important class of materials, possessing a large surface area to volume ratio, with applications ranging from thermoelectric and photovoltaic materials to supercapacitors. In-Situ X-ray Reflectivity and Grazing Incidence Small Angle X-Ray Scattering (GISAXS) were used to monitor thin-films grown from Tungsten Silicide (WSi₂) and Copper (Cu) nanoclusters. The nanoclusters ranged in size from 2 nm to 6 nm diameter and were made by high-pressure magnetron sputtering via plasma gas condensation (PGC). X-Ray Reflectivity (XRR) measurements of the films at various stages of growth reveal that the resulting films exhibit very low density, approaching 15% of bulk density. This is consistent with a simple off-lattice ballistic deposition model where particles stick at the point of first contact without further restructuring.

¹DOE Office of Basic Energy Sciences under contract DE-FG02-07ER46380

Jeffrey Ulbrandt
Univ of Vermont

Date submitted: 11 Nov 2016

Electronic form version 1.4