



Tutorial #2

Atomistic understanding of thin film growth dynamics

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The tutorial covers fundamental aspects of thin film growth dynamics, with emphasis laid on atomic-scale mechanisms of early stages of growth (island nucleation and coalescence), and later stages of microstructural evolution in polycrystalline and epitaxial layers. Insight on thermodynamics and kinetics models is provided. Microstructure development is reviewed, beginning with elemental films and their classification by structure zone diagrams, and then moving to multicomponent and multiphase film growth. Examples on the impact of primary deposition variables such as the deposition flux, kinetic energy of incoming particles and growth temperature, as well as interaction with the substrate material will be discussed based on atomistic computer modelling and in situ and real-time diagnostics.