

Physics Colloquium

Atomic Scale Control of Metal Films via Electronic Growth Modes

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114 Begeman Hall

Controlled metal film deposition is a key component in fabricating electronic devices. In most situations, film morphology is controlled by a mixture of chemical reactions, surface tension, and growth kinetics as atoms bounce about the surface before coming to equilibrium. To control growth at the nanometer scale, a very fine balance must be struck leading to complex and expensive growth techniques. However, electronic growth modes, which depend on quantum electronic states within the metal, provide an alternate pathway in which the film morphology is a function solely of the electronic properties of the metal film. Until recently, this growth mode has only been found in a small number of systems and only achieved at cryogenic growth temperatures which minimize the contributions of other factors. In the past couple of years, our research group at UNI has discovered an entirely new class of systems which exhibit electronic growth at temperatures well above room temperature. This has allowed us to fine tune atomic scale growth in gold and silver systems and we believe the process is extendable to a great many more.

Everyone Welcome! Refreshments Provided.