

Quantum Engineering of Metallic Nanostructures

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Abstract: In ultra-thin epitaxial metallic films, confinement of electronic states along the vertical direction leads to the formation of quantum well states (QWS). Over the past few years it has been shown that such QWS have profound effects on the thermodynamic stability as well as the kinetic processes of metallic thin film formation¹ (the so-called quantum growth phenomena). More recently, it has been found that QWS can also impact other physical/chemical properties. This talk will present several new developments including (a) the quantum size effect on superconductivity in the ultra-thin film regime (approaching a single atomic layer)²; and (b) quantum size effects on work function in metallic thin film nanostructures³.

References

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