

The 146th MANA Special Seminar



Making Nanoscale Metal Features on Atomically Clean Silicon Surfaces with a Stencil

Chair: Dr. Masakazu Aono (MANA Director-General)

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Metal features with nanometer scale edge definition have been created in UHV on atomically clean Si(001) surfaces with a stencil. These features were subsequently characterized by scanning tunneling microscopy and scanning electron microscopy. The best feature edge definition achieved was < 10 nm. At the same time, the metal feature / silicon boundary often showed significant spreading of a sub-monolayer of metal beyond the deposited area, well in excess of what can be accounted for by shadowing due to finite mask to sample spacing. This spreading may pose a limit on the ultimate resolution that can be achieved for metals deposited on atomically clean silicon surfaces. At the same time, deposition through a stencil combined with atomic resolution imaging provides new opportunities to study surface diffusion and other aspects of film growth behavior. For example, metal spreading beyond the deposition region differs for different metals, and can be related to the nature of the 2D to 3D transition in thin film growth for each system.

Venue: Seminar Room #431, MANA Bldg.

Date: June 4th Friday Time: 14:00-14:45

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