

## **New Tools for Electrodeposition Studies: Scanning Probe Microscopy**

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Electrodeposition of metals remains one of the key issues in electrochemistry. It has received renewed interest in microelectronics and related areas as a simple, yet versatile technique for fabricating ohmic contacts, Schottky barriers, layered structures or even nanostructures. On the other hand, metal deposition from solution remains a fascinating area of fundamental research, in which important aspects of electrocrystallization, solid-solid interactions, surface dynamics and diffusion, epitaxial growth and atom-to-solid transitions can be studied. Despite highly sophisticated electrochemical as well as spectroscopic techniques, which are available for the study of metal deposition, the invention of the scanning tunneling microscope (STM) has opened the door to structure information of such unbelievable detail, one would not have dared to even dreamed of at the time the Electrochemical Society was born.

In this lecture the power of STM is demonstrated with selected examples of the initial stages of metal deposition, also showing the weak spots of this fascinating technique. The examples will focus on the following three topics: 1) Influence of surface defects on the structure of a growing overlayer. 2) Metal deposition onto chemically modified surfaces. 3) Nanostructuring of surfaces by tip-induced metal deposition.