

STM from childhood to maturity

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The Scanning Tunneling Microscope (STM) has revolutionized our ability to explore, and manipulate, solid surfaces on the size scale of atoms. Besides its unparalleled spatial power, the STM is also capable of studying dynamical processes, such as molecular conformational changes, by recording current traces as a function of time. The STM can also be employed to measure the physical properties of molecules or nanostructures down to the atomic scale. For many years STMs lacked chemical specificity, requiring complementary spectroscopic tools to identify the chemical species being imaged. However, recently STM-IETS (STM Inelastic Electron Tunneling Spectroscopy) has been developed to measure the vibrational spectrum of a single molecule, allowing STMs to be used as a tool for chemical analysis of single molecules. This talk does not aim to give a full overview of the field, but rather it aims to introduce and illustrate several recent developments with a few simple scholarly examples.