

SCANNING TUNNELLING MICROSCOPY IN A MICROAMPÈRE RANGE

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Scanning tunnelling microscopy is well suited for imaging and spectroscopy of atomic and molecular structures. Usually, small tunnelling currents are used in an attempt to minimize the disturbing influence of the microscope tip. In my talk I will mostly present experiments which are performed — contrary to the above situation — at unusually large currents. These experiments provide information on, e. g., the conductance of a single adatom (be it magnetic or non-magnetic) on a single crystal surface. Microamp currents can also be run through a single C₆₀-molecule in a reproducible manner. The orientation of the molecule is observed to significantly influence the conductance. Under certain conditions we also observe switching phenomena. Finally, I will address the emission of light from a tunnelling microscope. Surprisingly, we detect light at photon energies which exceed the energy of a tunnelling electron.