

Application of scanning probe microscopy for the development and study of nanostructures.

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The scanning probe microscopy (SPM) has become a useful tool with a wide spectrum of applications, including magnetic force microscopy (MFM), conductive atomic force microscopy (CAFM) and nanolithography. In this presentation we'll present several studied systems to discuss some of these applications.

The CAFM was used to study the influence of low angle ion etching to improve the quality of high T_c superconductor's surface for technological applications. Electrically controlled nano-indentation (ECNI) was used to develop AFM nanotemplates which allow to contact a single nano-object, to fabricate nanojunctions (i.e. magnetic tunnel junctions, spin filters, etc) or to fabricate nanocontacts to study mesoscopic transport. Gold-gold nanocontacts were fabricated using ECNI trying to achieve the smallest contact size. In this limit, the indentation process is stochastic. Although the high nanocontacts resistance (from 100 Ω to 1000 Ω), they show a metallic like behavior, indicating its small size.