

Fabrication and Testing of Versatile Multifunctional AFM Probes for Integrated SPM/SEM Analysis (CPEM)

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The scientific community is currently focused on correlating imaging techniques for nanostructures and exploring new approaches for their preparation and characterization. To this end, combining scanning probe microscopy (SPM) techniques with electron microscopy (SEM) has become increasingly relevant. At the Institute of Physical Engineering, we collaborated with NenoVision, a start-up company, and achieved some interesting results by utilizing the potential of hollow optical fibers for correlative imaging (CPEM - Correlative Probe and Electron Microscopy). This development significantly enhances the capabilities of existing SPM probes by allowing for the precise delivery of intense light and a working medium, typically a gas, directly beneath the tip of the SPM probe in an SEM chamber. This innovative approach makes it possible to actively modify the physical properties of the nanostructures being prepared, rather than simply determining "only" their topography. Additionally, we are currently working on developing and refining a completely new, interchangeable cap-like tip for the SPM probe to further advance nanoscience and its applications. Our research in this field is focused on developing this unique exchangeable cap-like tip for SPM probes as a critical milestone in advancing nanoscience and its applications.