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“Nanoscale piezoelectricity of functional materials: from oxides to bioinspired nanotubes and tissues”

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Electromechanical coupling is ubiquitous in inorganic and biological materials and directly underpins sensing/actuating functionalities of various systems. Rapidly developing Piezoresponse Force Microscopy (PFM) and Electromechanical Strain Microscopy (ESM) offer a pathway to explore electromechanical activity at the nanoscale with a few nm resolution that allows to uncover fundamental mechanisms of the local piezoelectric phenomena. In this presentation, I will briefly overview the new features in PFM and ESM and present our recent results on nanoelectromechanical imaging in various materials used in ferroelectric memories, piezoelectric transducers, and microelectromechanical systems. Finally, recent results on bioferroelectricity in peptide nanotubes and aminoacids will be discussed.