

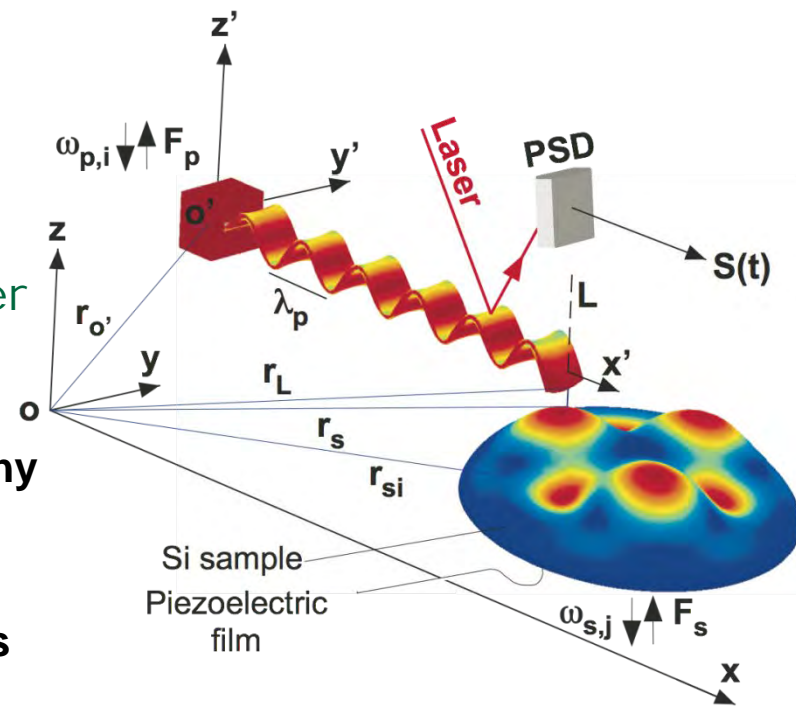
# New Capabilities for the Atomic Force Microscope

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Funding Source: BioEnergy Science Center (BESC)\*

- The atomic force microscope uses a force-sensing cantilever with a sharp tip to measure the topography and other properties of *surfaces* depending upon material-dependent attractive and repulsive forces.
- ORNL researchers have extended the capability of atomic force microscopy to significantly improve its capability to image and analyze biological material.
- New modes or modalities were developed for topographic analysis and characterization of biological material such as plant cells which will improve the use of AFM in biological research.
- In addition a new modality was developed for AFM permitting subsurface imaging and analysis of biological material.
- The subsurface capability can be used to detect abnormalities not visible on the surface or inclusions such as intracellular nanoparticles.
- The dramatic increase in the information extracted from a single run provides an unlimited number of usable signals which are suitable for high resolution imaging in liquid, gases and vacuum.



*L. Tetard, A. Passian, T. Thundat, "New modes for subsurface atomic force microscopy through nanomechanical coupling," Nature Nanotechnology 20 December 2009 doi:10.1038/nano.2009.454*