Atomic Force Microscopes

• How does an AFM work?
  • The AFM works by scanning a fine ceramic or semiconductor tip over a surface much the same way as a phonograph needle scans a record (for those of you that know what a record player is!).
  • The tip is positioned at the end of a cantilever beam shaped much like a diving board.
  • As the tip is repelled by or attracted to the surface, the cantilever beam deflects.
  • The magnitude of the deflection is captured by a laser that reflects at an oblique angle from the very end of the cantilever.
  • A plot of the laser deflection versus tip position on the sample surface provides the resolution of the hills and valleys that constitute the topography of the surface.
  • The AFM can work with the tip touching the sample (contact mode), or the tip can tap across the surface (tapping mode) much like the cane of a blind person.