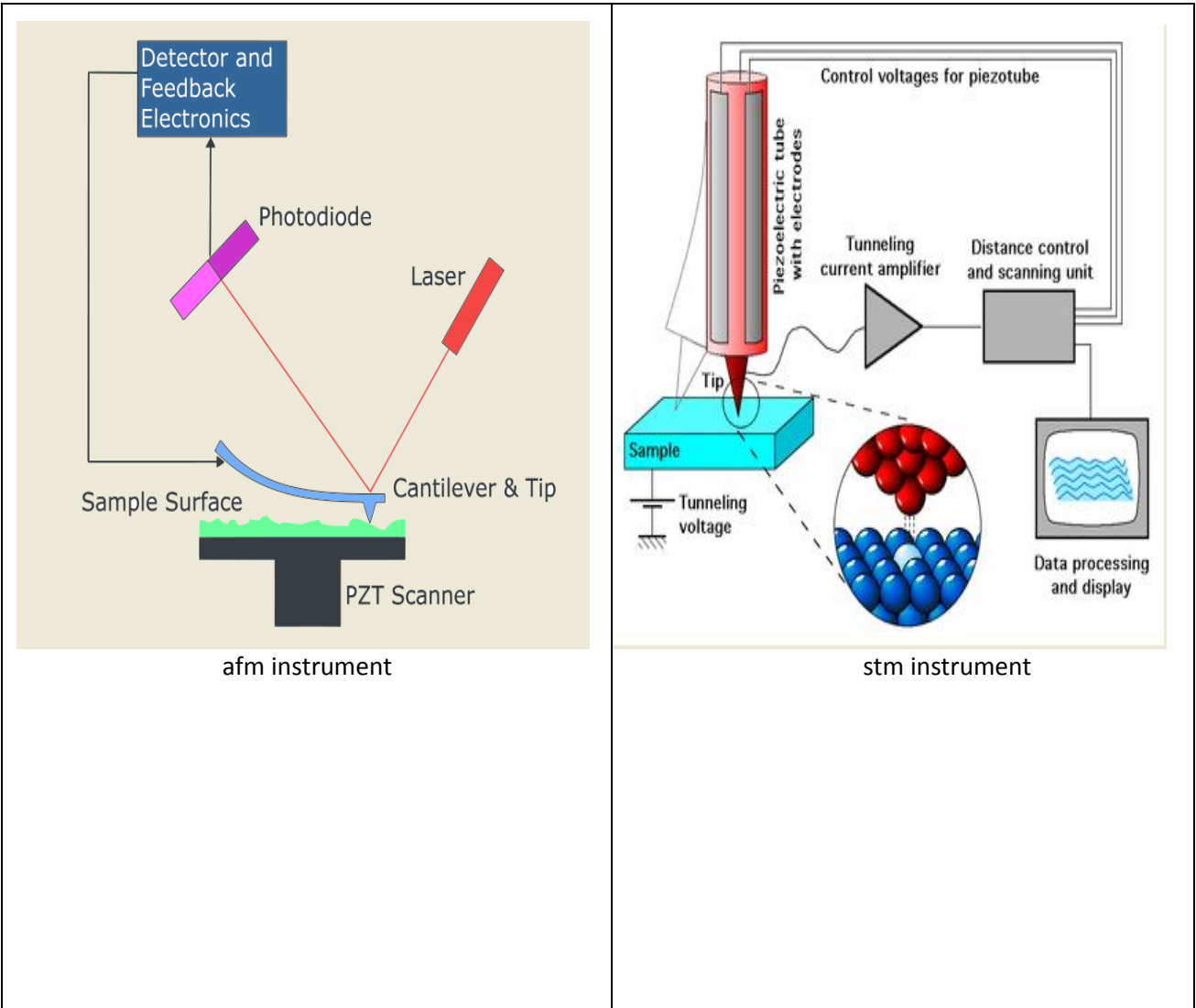


DIFFERENCES BETWEEN STM AND AFM

AFM	STM
<ul style="list-style-type: none"> ➤ It can be used for insulators as well as conductive samples. Conductivity is not necessary. ➤ Like STM it uses atomically sharp tip is used(This time tip is connected to a cantilever.) When the tip is brought very close to the sample chemical attraction or repulsion (Van der waals) occurs and the tip moves up and down. This movement is recorded. ➤ Tips mostly Si and Si₃N₄ . ➤ Physically contact the specimen. (except non-contact mode) ➤ Measures small force between tip and sample. ➤ Modes: <ul style="list-style-type: none"> • Contact mode • Non-contact mode • Tapping mode ✓ Uses feedback-loop ✓ Resolution limited by size of tip (2-3nm) ✓ Resolution of imaging 5nm lateral and 0.1nm vertical ✓ Magnification max is 10⁸ 	<ul style="list-style-type: none"> ➤ Requires conductive samples.Samples must be conductor or semiconductor. ➤ A very sharp metal tip(conductive) is used for scanning the surface. When a voltage is applied between the tip and the sample a tunneling current occurs. This tunneling current is measured. ➤ Conductive tips such as Pt/Ir wire or etched W metal . ➤ Does not contact the sample. ➤ Measures tunneling current ➤ Modes <ul style="list-style-type: none"> • Constant current mode • Constant height mode ✓ Uses feedback loop ✓ Good resolution is considered to be 0.1 nm lateral resolution and 0.01 nm depth resolution. With this resolution, individual atoms within materials are routinely imaged and manipulated ✓ Better resolution than AFM. Magnification max is 10⁹



Not: http://virtual.itg.uiuc.edu/training/AFM_tutorial/ Bu sayfada da hem stm hem afm 'i anlatan animasyonlar var.