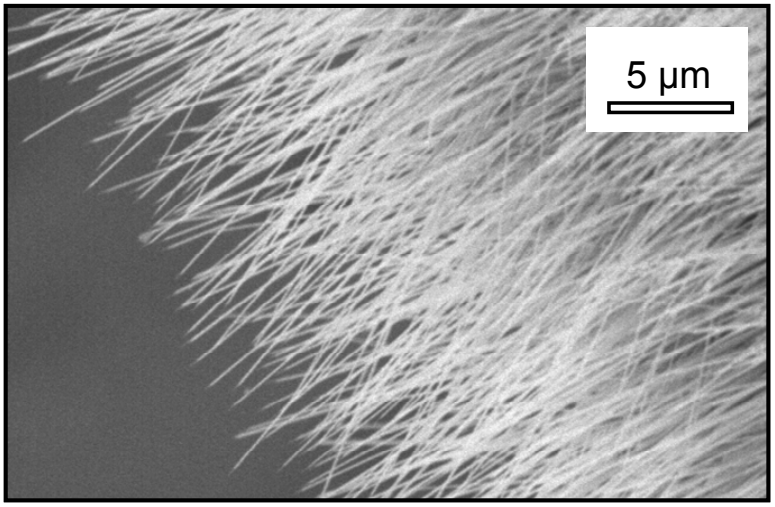
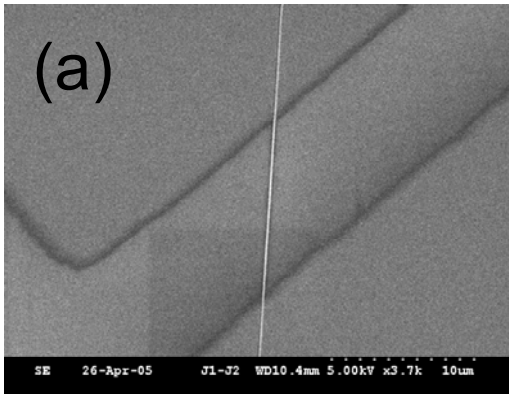
1. Growth of NWs

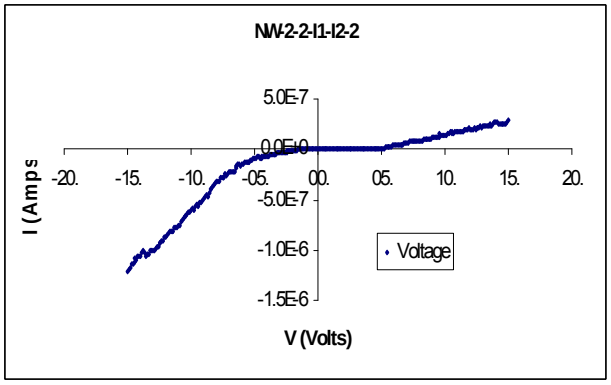
Different growth models have already in place to understand the growth mechanism of a particular nanostructure. Knowledge and understanding of phase diagram of different materials and their compounds should be sufficient to synthesize a nanostructure (specially nanowires) but still it takes a few attempts to optimize the growth conditions or replicate someone else's work into a laboratory. As a curious graduate student I worked on a short project involving the growth and physical properties measurements of ZnO nanowires. ZnO is a wide bandgap semiconductor and of immense importance for solid state laser. Later I worked on the nanomanipulation of several different kind of wire to tune the desired physical properties. In figure 1, I show a SEM image of ZnO nanowires. ZnO nanowires are grown with CVD and growth process is self catalytic VLS process. ZnO can form several other nanostructures (i.e., nanobelts, nanocombs, nanoshees, nano-tetrahydral-pyramids etc.) can control growths of only one dominant structures can be achieved by controlling the growth parameters.

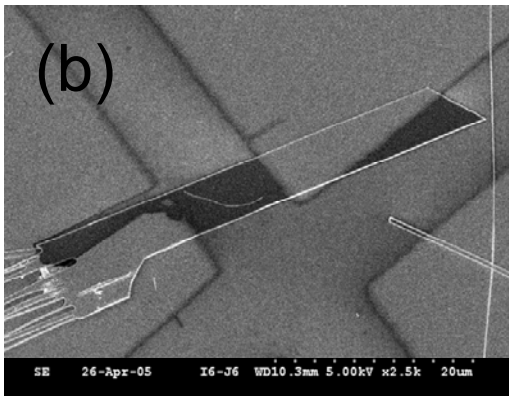


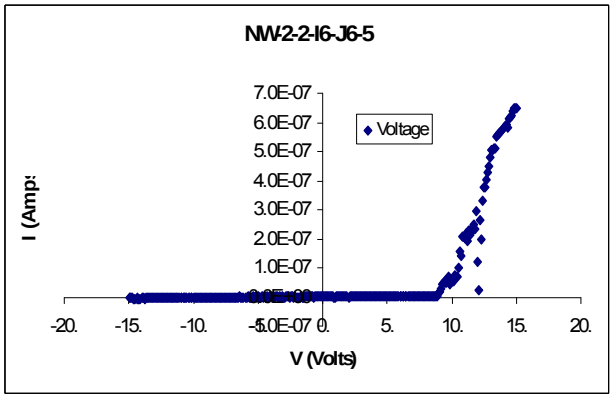
2. Electrical Properties of Nanostructures:

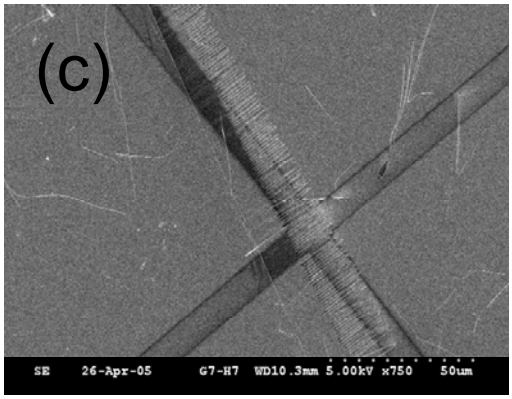
In figure 2(a), (b) and (c), we show the difference in electrical properties of different structures of the same material (ZnO). I-V data is collected using Keithley-4200.

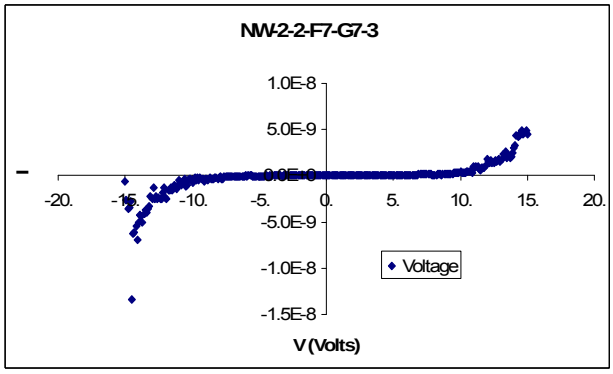






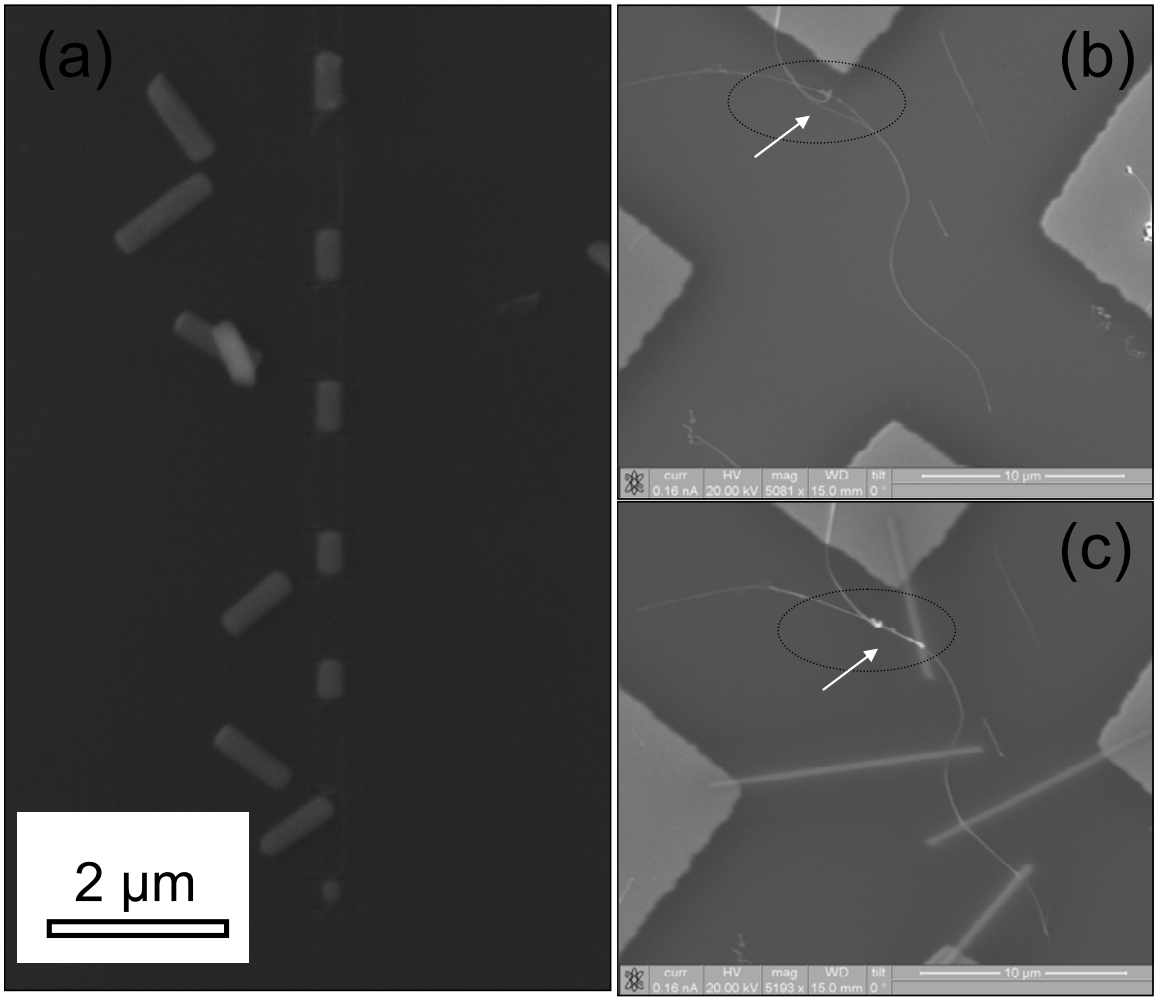






3. Nano-Manipulation of Nanowires:

In figure 3(a), I show a nanomanipulation of a GaP nanowire to study the physical properties as function of wire length. Surprisingly, we observed the lasing from short nanowires during Raman measurements. In figure 3(b) and (c) we show that two wire can be join as a affect of charging. Notice the difference between the dotted ellipse and arrow.



For more information about Nanowire research visit:
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