

2009-2010 PhD Qualifying Examination

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1. When two different metals with different work functions are coming closer, what would happen before and after those two metals contact to each other? Draw a band diagram, and explain current-voltage characteristics across the two metals.
2. If one of the metals is replaced by a semiconductor, draw a band diagram and explain current-voltage characteristics across the metal-semiconductor..
3. If there are energetically localized electronic states between the metal and the semiconductor, how the band diagram could change?