

## **Looking beyond the silicon technology**

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### **Abstract**

The evolution of high speed computers over the past 50 years has been fueled by the technology developed to miniaturize the silicon transistor. The process of device miniaturization has been achieved by gradual modification of design, materials, and fabrication process. However, as the device dimensions are rapidly approaching around 10 nanometer scale, the traditional methods and materials are pushed to their limits. Moreover, short-channel effects and current leakage will prevent further reduction in the size of these devices. Devices based on quantum mechanical laws offer a possible solution to continue the trend predicted by Moore's Law. These devices, based on nanowires, nanotubes, and graphene will alter the operating principles and will present new challenges. This presentation will consist of two parts, first the basic properties of the nanostructures will be reviewed, and then the issues related to nanoscale devices will be discussed.

### **Bio**

Raj Solanki is a professor in the Department of Physics, with a joint appointment in the Department of Electrical and Computer Engineering at Portland State University. Prior to joining PSU, he was in the ECE Department at OGI. After receiving his Ph D from Colorado State University, he was a Post-Doctoral Research Fellow at The Johns Hopkins University. His research has covered several aspects of optics and micro/nanoelectronics, including flat panel displays and topics related to down-scaling of electronic devices. Current research in his lab includes nanoelectronics and electrical detection of biological molecules.