

**NUS Graduate School for Integrative Sciences and Engineering
Research Project Write-up**

Title of Project : Directed growth and characterization of low-dimensional nanomaterials for electronic device applications.

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Short Description

The project studies the effect of surface fields on the growth of one-dimensional (nanowires, nanotubes) and two-dimensional materials, and exploits surface fields to laterally direct the growth of such materials. The ability to position and align nanostructured materials in a scalable fashion is a key to the integration of such nanostructures for practical device application. We have recently developed an approach to the generation of surface fields using plasma-induced charging, and demonstrated the ability to laterally direct the growth of carbon nanotubes in a manner that is compatible with wafer-scale processes. This enabling technology will allow us to develop a variety of electronic devices based on carbon-based materials and semiconductors grown using a bottom-up approach that is being explored in this project. Although the target application is in electronic devices, the same approach can also be used in other application areas such as microelectromechanical systems (MEMS) and microfluidic devices.