

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

**Title of Project :** Nanosized graphene molecules as materials for electronics

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**Short Description**

Organic field effect transistors (FETs) have promising applications for large area flexible display (e.g. electronic papers), sensor devices and radiofrequency identification tags etc... Organic semiconductors with high charge carrier mobilities, high environmental stability and easy solution processibility are highly desired for high performance FET devices. Solar cell, which can convert solar energy to electricity, is one of the most important energy techniques. High efficiency solar cells require materials (either donors or acceptors) with high mobilities, large light absorption and good stability. We are interested in a kind of nanosized graphene molecules and related structures, which are expected to fulfill all the requirements for both high performance FETs and solar cells. The research will be done in several aspects: (1) materials synthesis and structural characterizations; (2) physical properties and self-assembling behavior studies by spectroscopic techniques, X-ray diffraction, polarized optical microscope, scanning tunneling microscope and transmission electron microscope etc...; (3) materials processing and device fabrications.