

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

Title of Project : Low power consumption devices

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Short Description

The demand for alternative and renewable energy has been increasing globally over the years as the world faces fuel shortage crisis. There are much effort from the science and engineering research communities in harnessing renewable energy, such as solar, hydropower, and wind. However, these solutions do not solve the essential problem of excessive energy consumption and wastage from our daily usage of electronic devices whose energy releases in to the environment, further aggravating global warming due to Joule-heating. It has been predicted that the power density of the personal computer microprocessors based on MOSFET technology. Therefore, managing the energy consumption efficiently with ultra-low power consumption devices will be a crucial research topic for future beyond-Moore and more-than-Moore devices. Therefore, in this program, we try to the device physics and performance of nanoscale FET and try to optimize and enhance their performance in order to reduce the power-consumption in each transistor. Ultimately, we aim to innovate the novel functional devices which can achieve million-folder reduction in operation power to satisfy the needs for the next generation electronic devices.