東京大学グローバルCOEプログラム　機械システム・イノベーション国際拠点

東京大学 THE UNIVERSITY OF TOKYO

GMSI Global Center of Excellence for Mechanical Systems Innovation

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Growth Mechanism of Well Aligned Semiconducting Single-walled Carbon Nanotubes on Quartz Substrate

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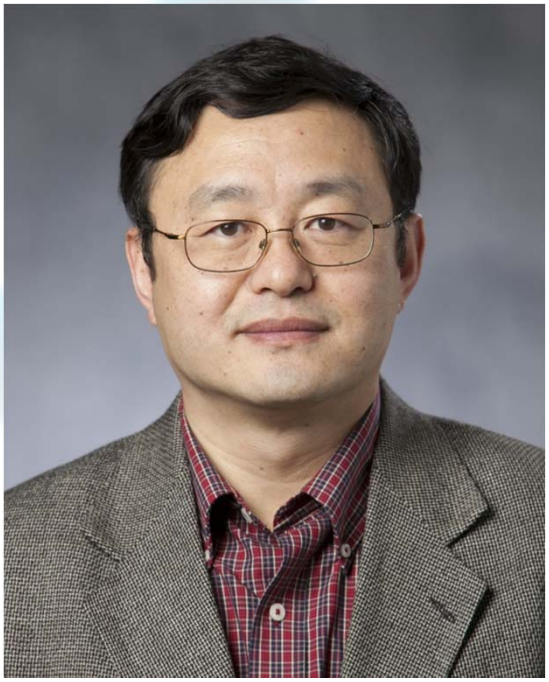
日時：2012年6月15日（金）　13:00–14:00
会場：東京大学工学部2号館 3F 31A会議室

要旨

Even though the devices made from individual nanotubes have shown outstanding performances such as high mobility, high current, high thermal conductivity, good chemical and mechanical stability, the high hope for the next generation of carbon nanotube based electronics is hampered by several major problems. Among them are the lack of reliable methods to control the alignment and position of nanotubes as well as and perhaps most problematically, the simultaneous growth of nanotubes with different chiralities, yielding random mixtures of metallic and semiconducting nanotubes. Even though the post-growth separation of metallic from semiconducting SWNTs have made good progress, the alignment and assembly of the separated nanotubes into devices are still challenging and not suitable for large scale fabrication. Consequently, a method that can directly produce well aligned arrays of pure semiconducting nanotubes is thought to be the ideal choice for large scale fabrication of nanotubes FETs. In this talk, we show that such a method is not a dream. Recently we have successfully synthesized high-density, horizontally aligned SWNTs on quartz wafers, and the thin-film transistors (TFTs) based on this SWNT array show high on-driving current density (up to ~220 μA/μm).

Full abstract is available at
http://www.photon.t.u-tokyo.ac.jp/~maruyama/visitors/JieLiuAbstract.pdf



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