

# TAKAHASHI LAB.

## [Nano-probing Technologies]

Centre for International Research on Micronano Mechatronics

<http://www.spm.iis.u-tokyo.ac.jp>

Nano-electronics

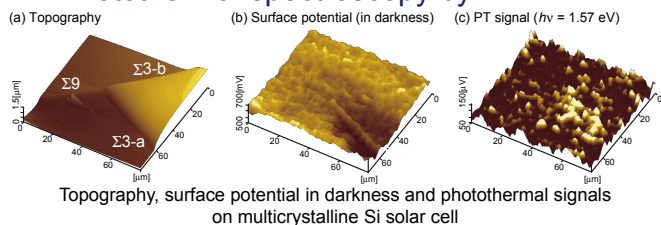
Department of Electrical Engineering and Information Systems

### Development of novel nano-probing technologies and nano-scale characterization of nano-materials for future device application

We aim at investigating electronic and optical properties in various nano-materials by means of nano-probe methods such as scanning tunneling microscopy (STM), atomic force microscopy (AFM) and related ones.

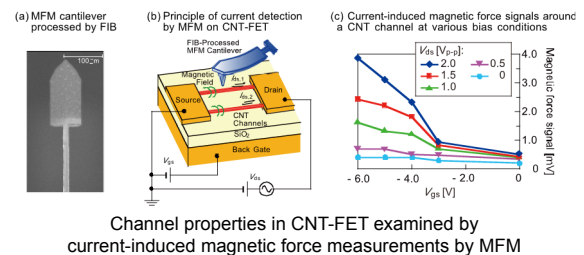
#### ◆ Characterization of Solar Cell Materials

- Photovoltaic properties and minority carrier dynamics
- Photothermal spectroscopy by AFM



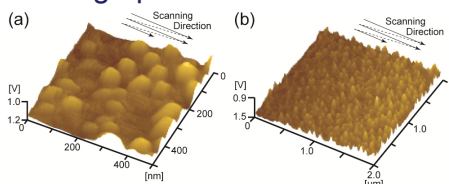
#### ◆ Characterization of Carbon Nanotube FETs

- Current detection by magnetic force microscopy (MFM)



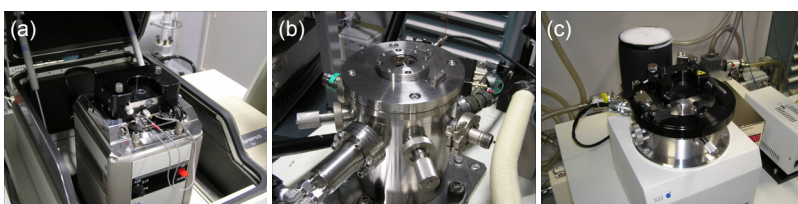
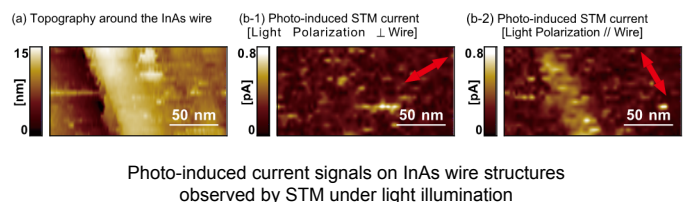
#### ◆ Development of Novel SPM Methods

- Fast imaging in AFM
- Novel operation methods for high performance SPMs

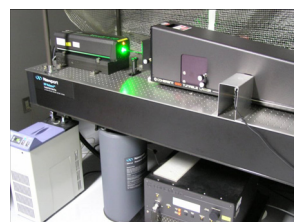


#### ◆ Physics in Quantum Nanostructure

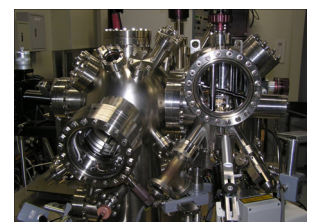
- Observation of physical phenomena in low-dimensional semiconductors



Multi-functional SPM equipments:  
(a) air type, (b)/(c) high vacuum and variable temperature type



Tunable  $Ti:Al_2O_3$  laser with solid state green laser



Variable temperature SPM in ultra-high vacuum