

TAKAHASHI LAB.

Nano-probing Technologies



Department of Informatics and Electronics
Centre for Interdisciplinary Research on Micro-Nano Methods

Nano-electronics

Department of Electrical Engineering and Information Systems, Graduate School of Engineering

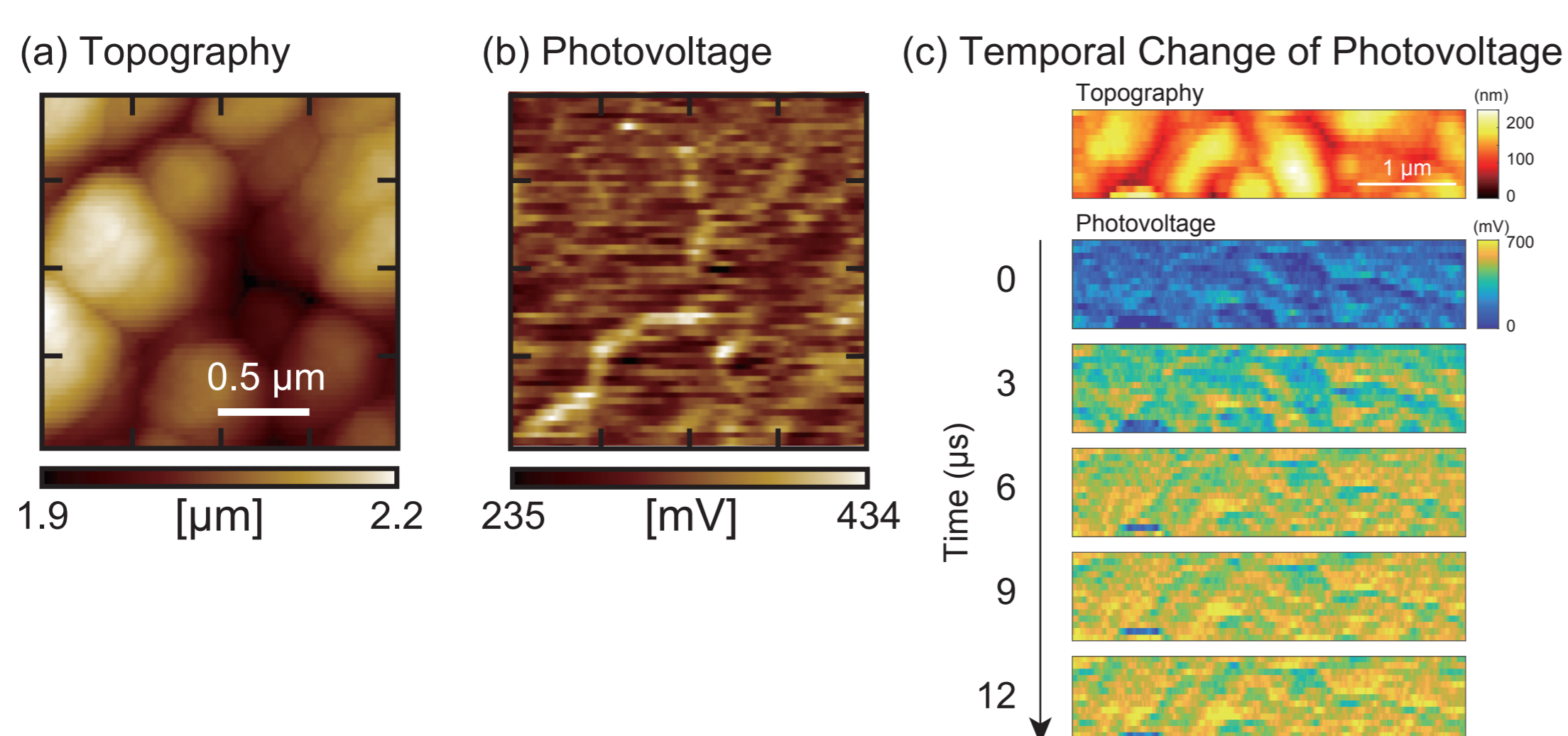
<http://www.spm.iis.u-tokyo.ac.jp>

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.

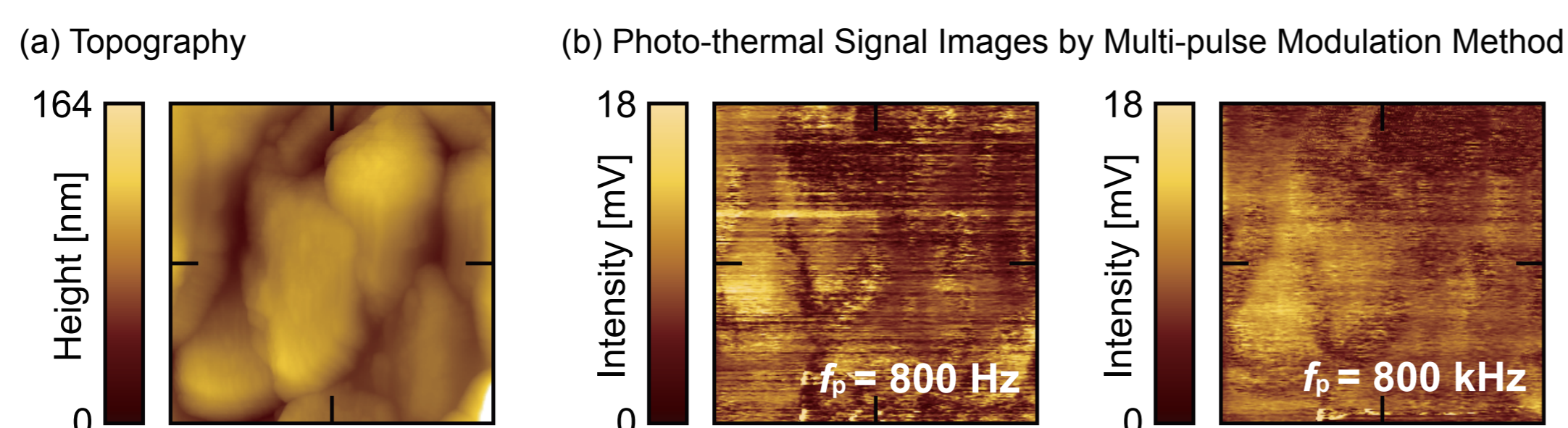
◆ Characterization of Solar Cell Materials

- Photovoltaic properties and minority carrier dynamics investigated by photo-assisted KFM



Surface topography and photovoltage distribution on CIGS solar cell and temporal change of photovoltage

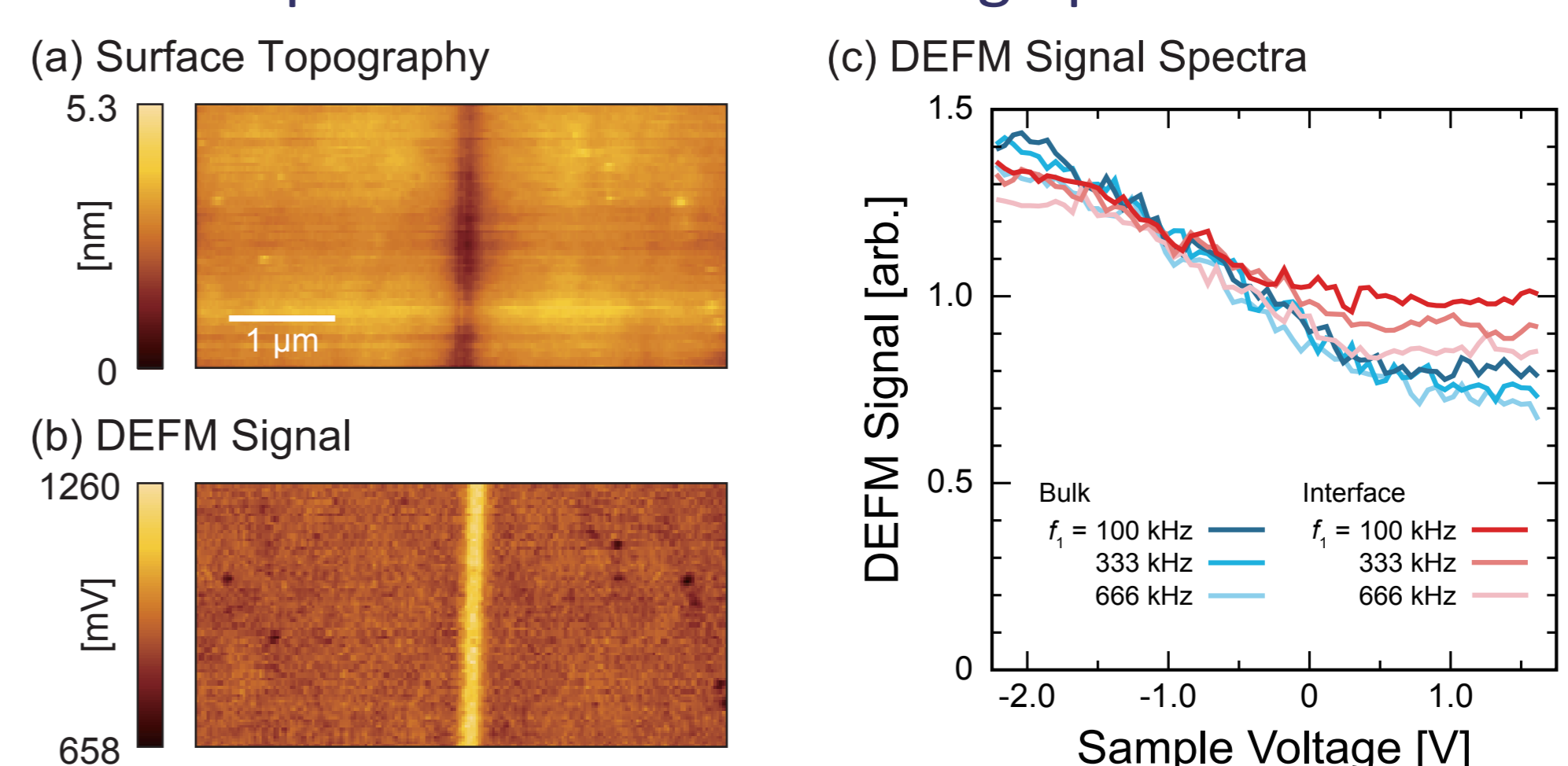
- Non-radiative recombination property of photo-carriers investigated by photothermal mode AFM



Images of topography and photothermal signals on CIGS solar cell

◆ Development of Novel SPM Methods

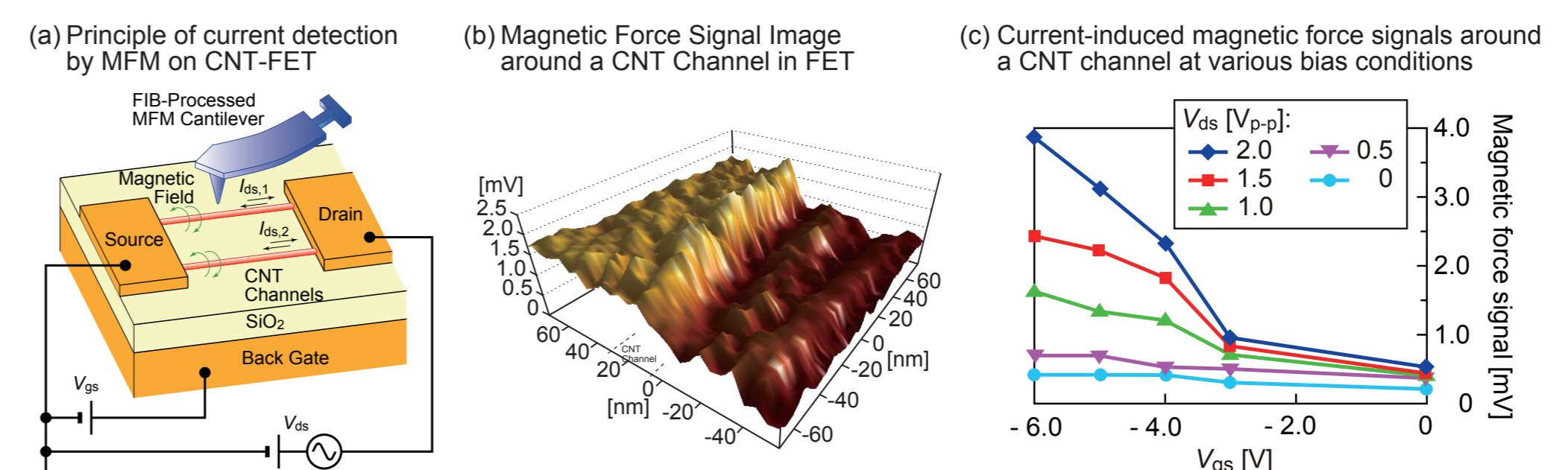
- Fast imaging in AFM
- Novel operation methods for high performance SPMs



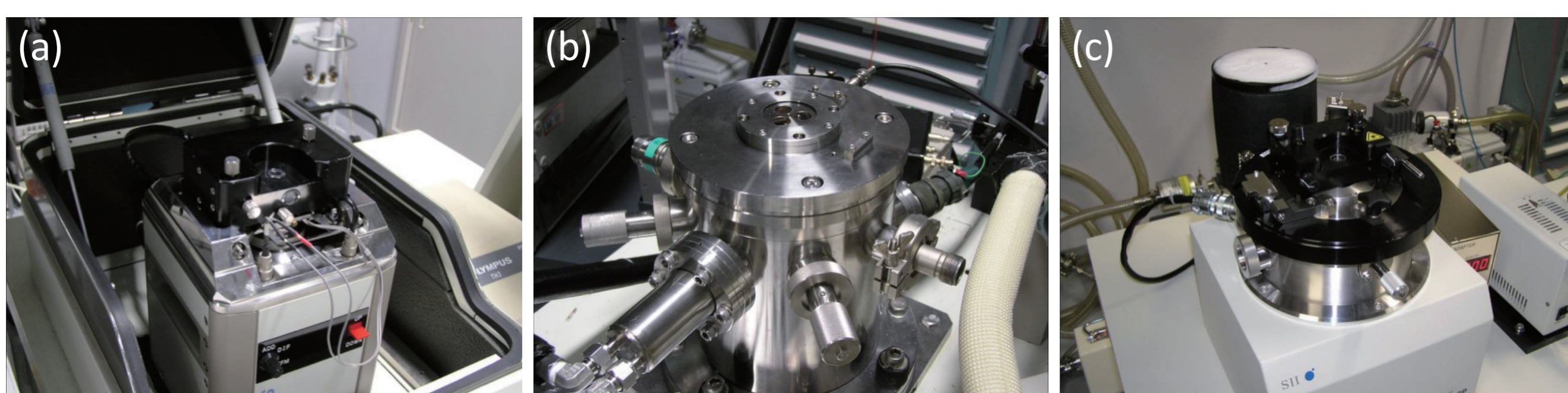
Cross-sectional observation around n-Si/n-Si junction interface by dual-bias modulation EFM (DEFM)

◆ Characterization of Carbon Nanotube FETs

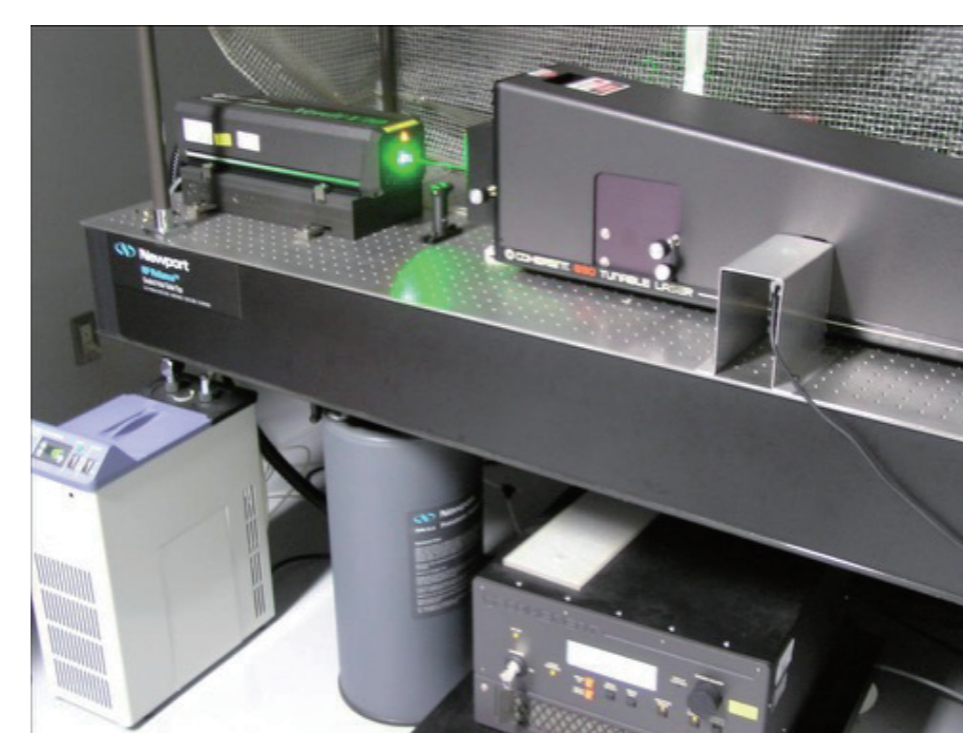
- Current detection by magnetic force microscopy (MFM)



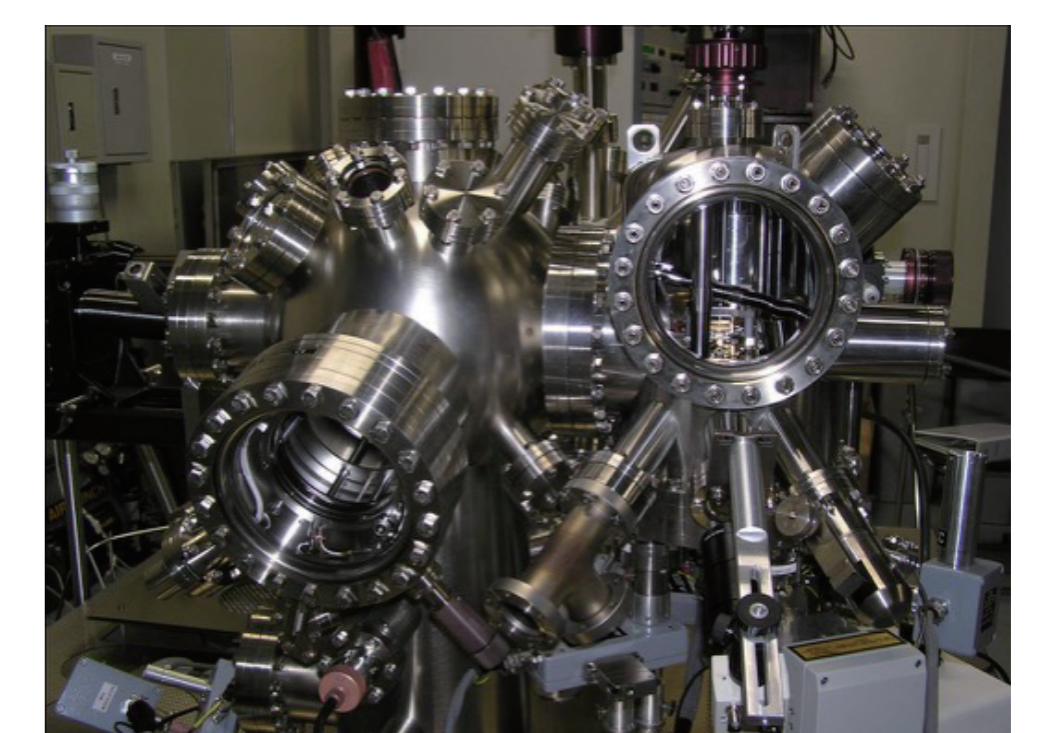
Channel properties in CNT-FET examined by current-induced magnetic force measurements by MFM



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



Tunable Ti:Al₂O₃ laser with solid state green laser



Variable temperature SPM in ultra-high vacuum