

TAKAHASHI LAB.

[Nano-probing Technologies]

Centre for Interdisciplinary Research on Micro-Nano Methods

Nano-electronics

Department of Electrical Engineering and Information Systems

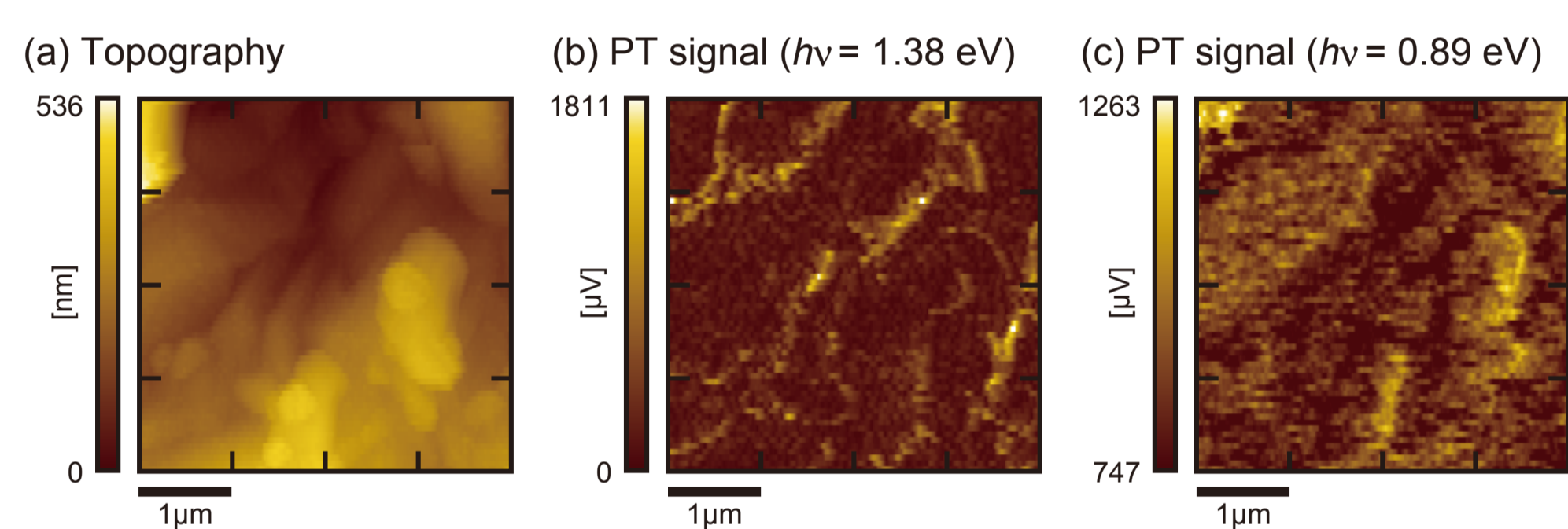
<http://www.spm.iis.u-tokyo.ac.jp>

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

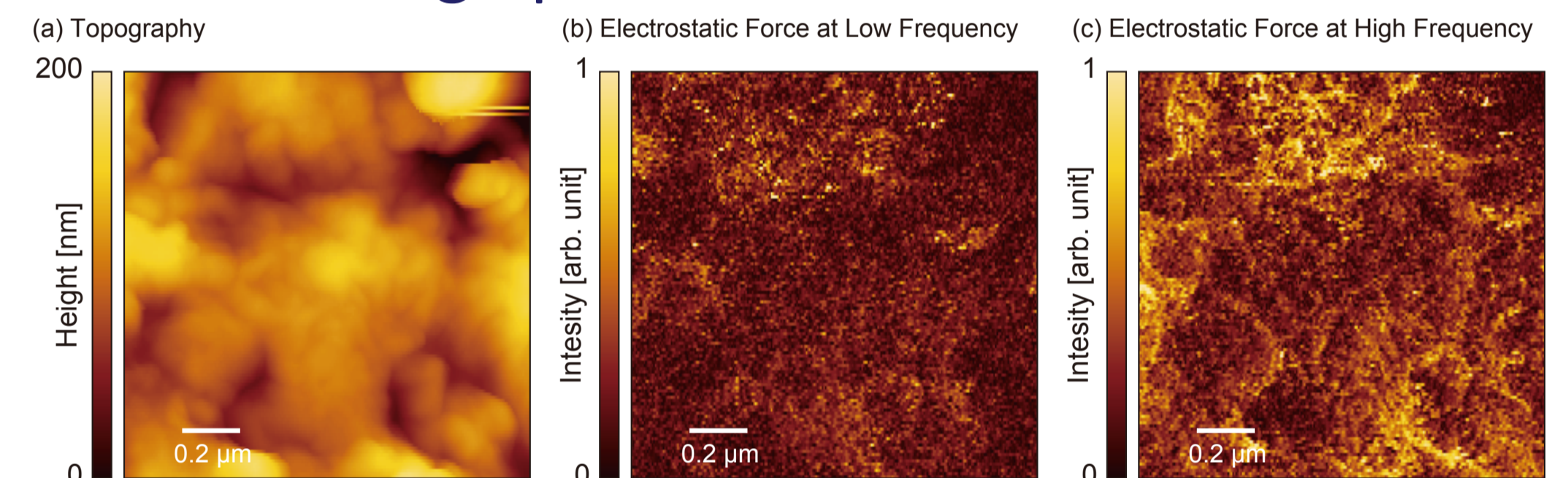
- Photovoltaic properties and minority carrier dynamics
- Photothermal spectroscopy by AFM



Images of topography and photothermal signals on CIGS solar cell

◆ Development of Novel SPM Methods

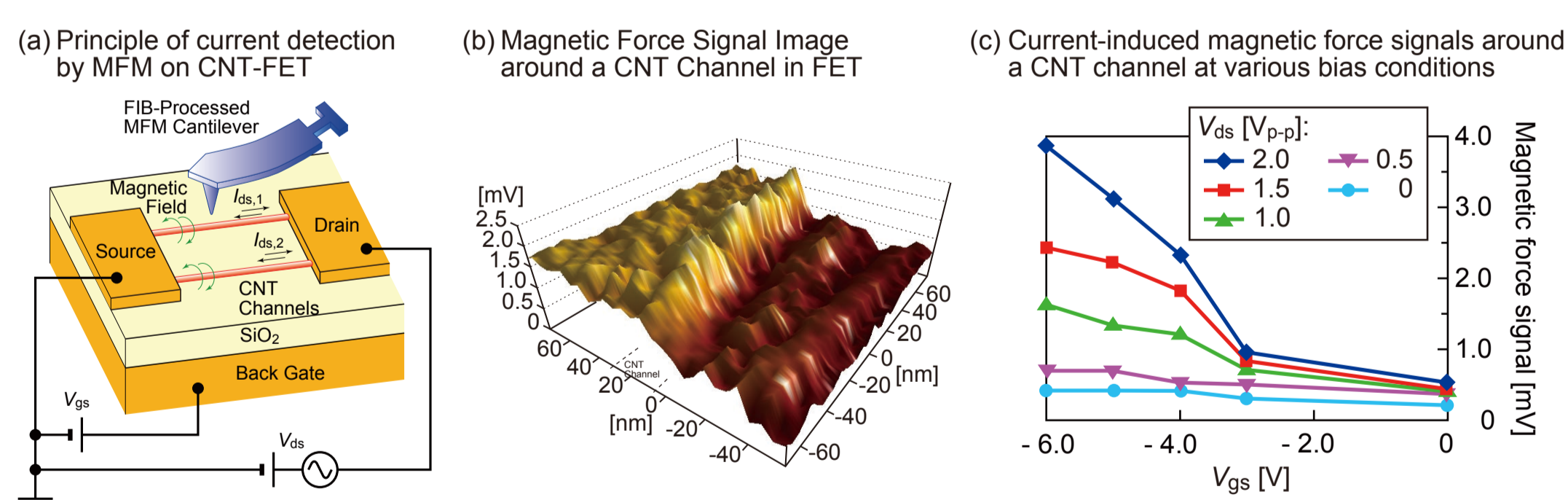
- Fast imaging in AFM
- Novel operation methods for high performance SPMs



Images of topography and electrostatic force on CIGS observed by dual-bias modulation mode EFM

◆ 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

◆ Physics in Quantum Nanostructure

- Observation of physical phenomena in low-dimensional semiconductors

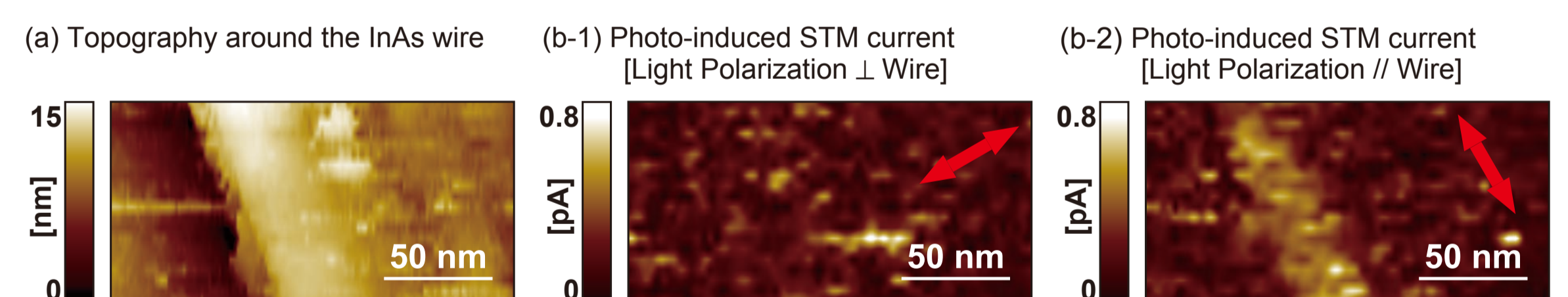


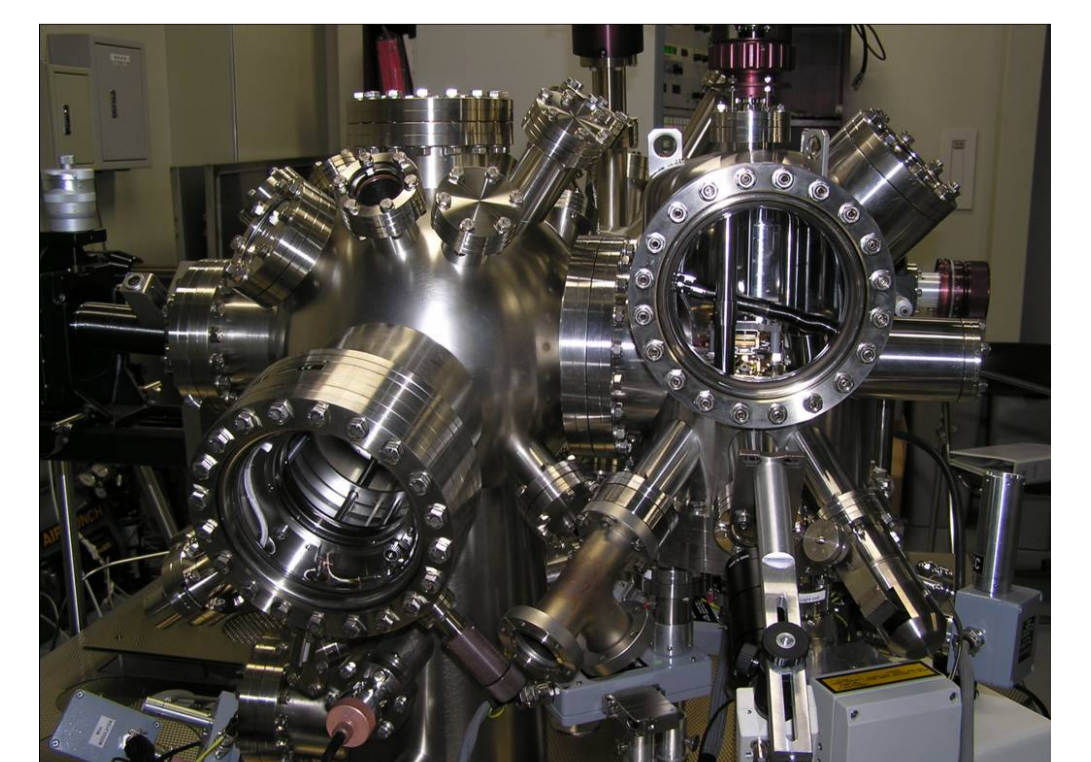
Photo-induced current signals on InAs wire structures observed by STM under light illumination



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