



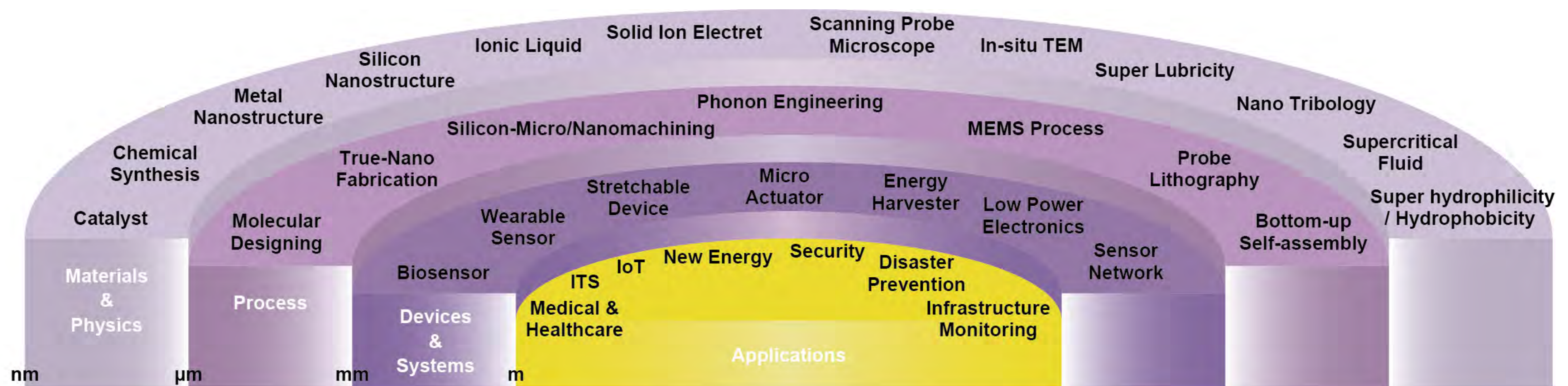
# Centre for Interdisciplinary Research on Micro-Nano Methods (CIRMM)

Materials Engineering  
Mechanical Engineering  
Precision Engineering Department  
Department of Advanced Interdisciplinary Studies  
Department of Electrical Engineering and Information Systems



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

## MEMS and True-Nano Technology for Cyber-Physical-System (CPS) Implementation



### True Nano Physics

Novel devices beyond the scale of conventional principles

### Nano Fabrication

In-house Fab-Lab for cutting-edge manufacturing

### Cyber Physical

MEMS sensors connecting between cloud and real world

We focus on exploring new methods of detection, imaging, selection and filtering of molecules and atoms, harvesting of energy from the nanometric level, control of friction, fabrication, diagnosis and even treatment. In parallel, we envisage large scale implementation of things small, such as sensors, energy harvesters, optical and diagnostic nano tools. As the name of the centre implies, we put emphasis on exploring new Methods, as opposed to improving existing techniques.

#### Kawakatsu Lab.

Dept. 2  
Ce-B02



Coupling to the Nano Regime

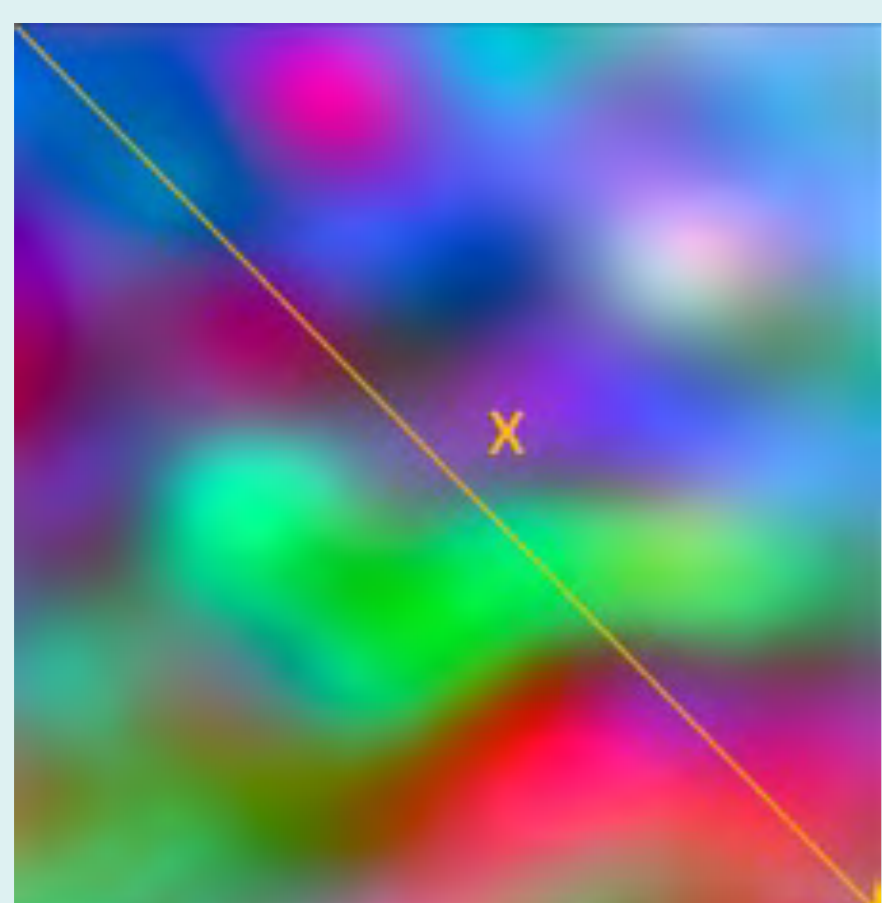


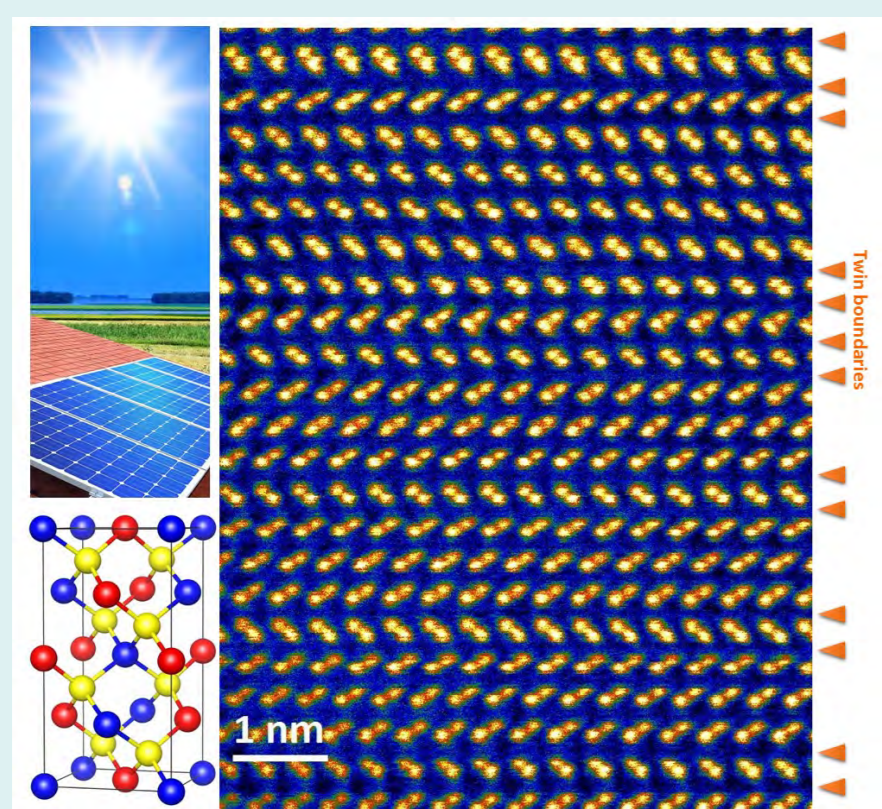
Image of silicon acquired with the colour AFM

#### Mizoguchi Lab.

Dept. 4  
Fe-312



Understanding Role of Atom and Electron in Material



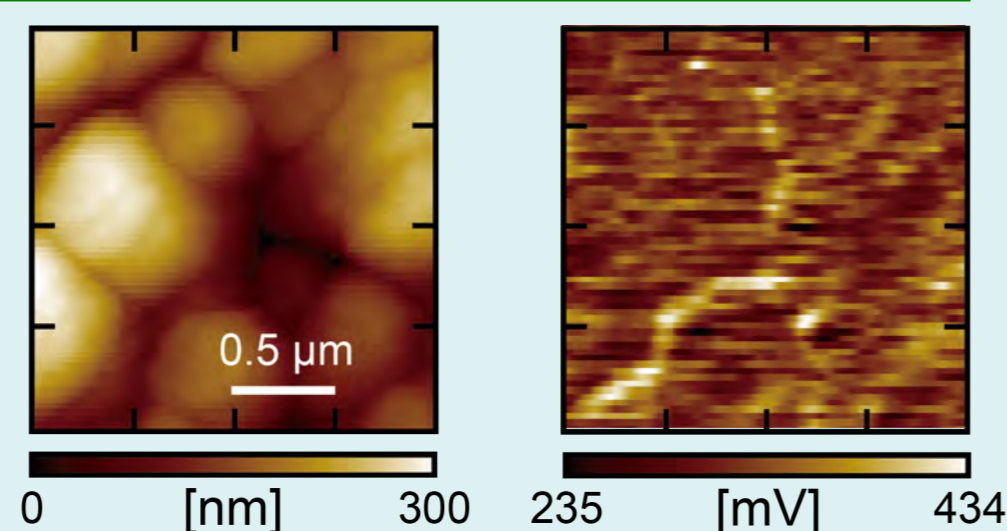
Atomic resolution image of multiple-twin boundary in photovoltaic cell material

#### Takahashi Lab.

Dept. 3 Ee-305



Nano-probing Technologies



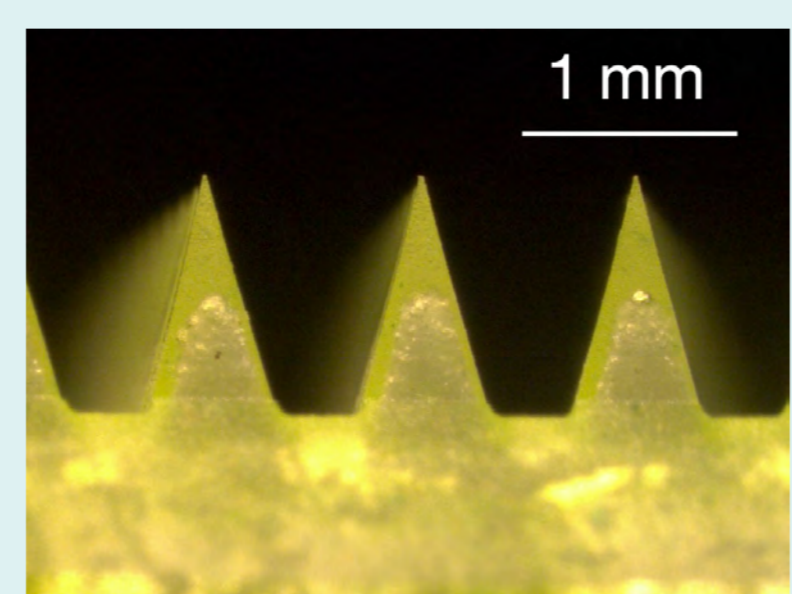
Images of topography and photovoltage on Cu(In,Ga)Se<sub>2</sub> solar cell

#### Kim Lab.

Dept. 2 De-B02/Dw-304



Micro Components & Systems



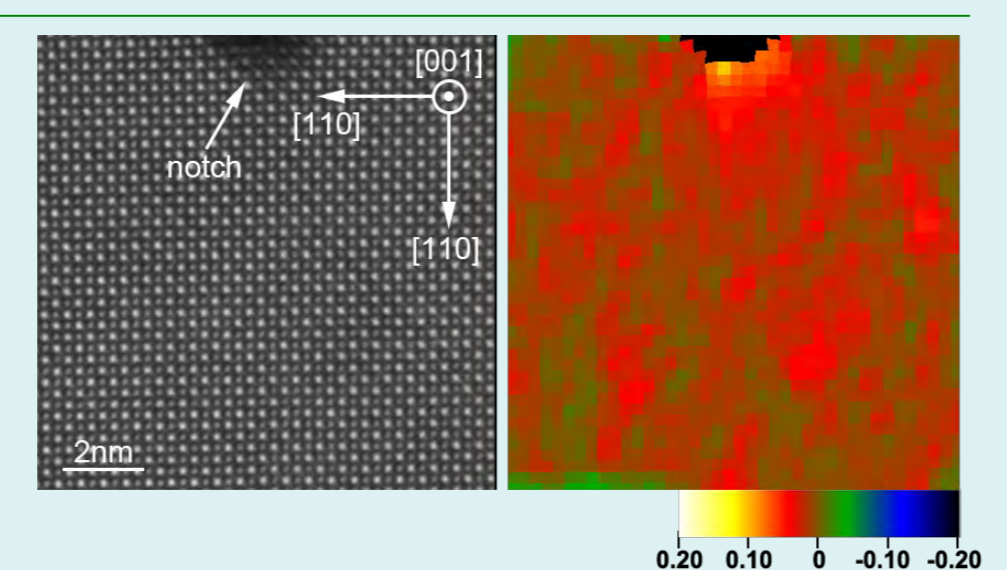
Porous microneedles for sensing

#### Tochigi Lab.

Dept. 1 Cw-305



Microstructures and Mechanical behavior



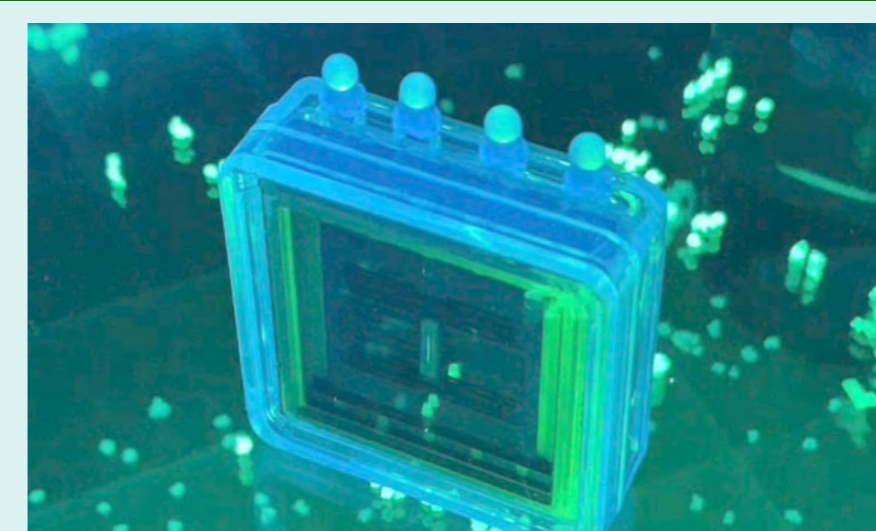
Local strain analysis based on atomic-resolution in situ TEM loading experiment

#### Toshiyoshi Lab.

Dept. 3 Ee-308



MEMS/NEMS



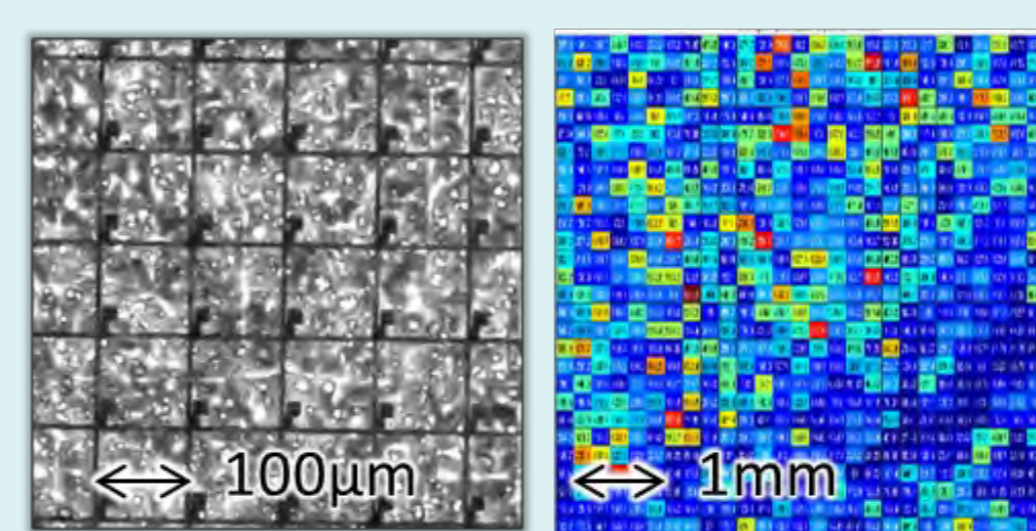
Electret MEMS vibrational energy harvester in operation

#### Tixier-Mita Lab.

Dept. 3 Ee-308



Bio CMOS/MEMS Platforms



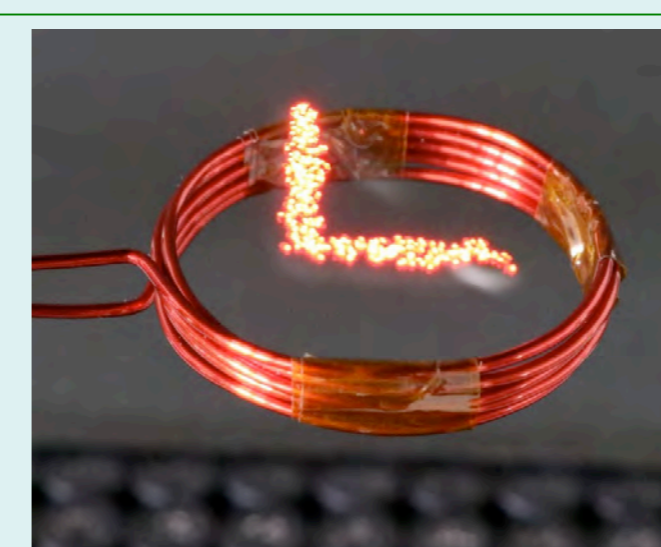
Electrophysiology of cardiomyocyte cells culture on a thin-film-transistor active matrix device

#### Takamiya Lab.

Dept. 3 Ew-206



Integrated Power Management



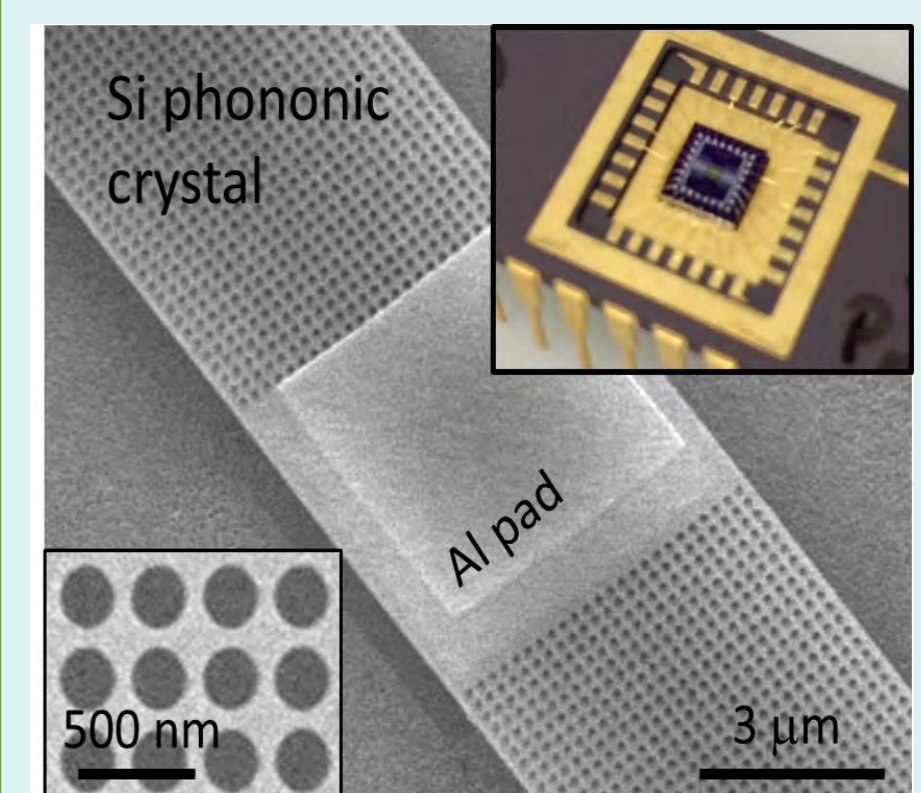
Millimeter-scale LED based on acoustic levitation for mid-air display

#### Nomura Lab.

Dept. 3  
Fe-207



Nanoscale Heat Transfer and Thermoelectrics



Nanoscale Si thermoelectric energy harvester

#### Matsuhisa Lab.

Dept. 3  
/RCAST  
Ee-412



Interactive electronic devices



Exceptional skin-conformability of the soft and stretchable display

