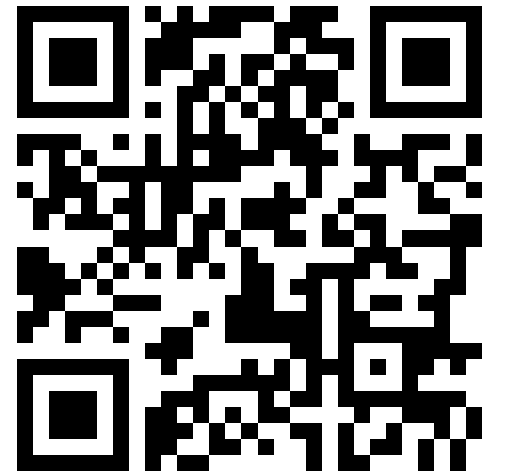




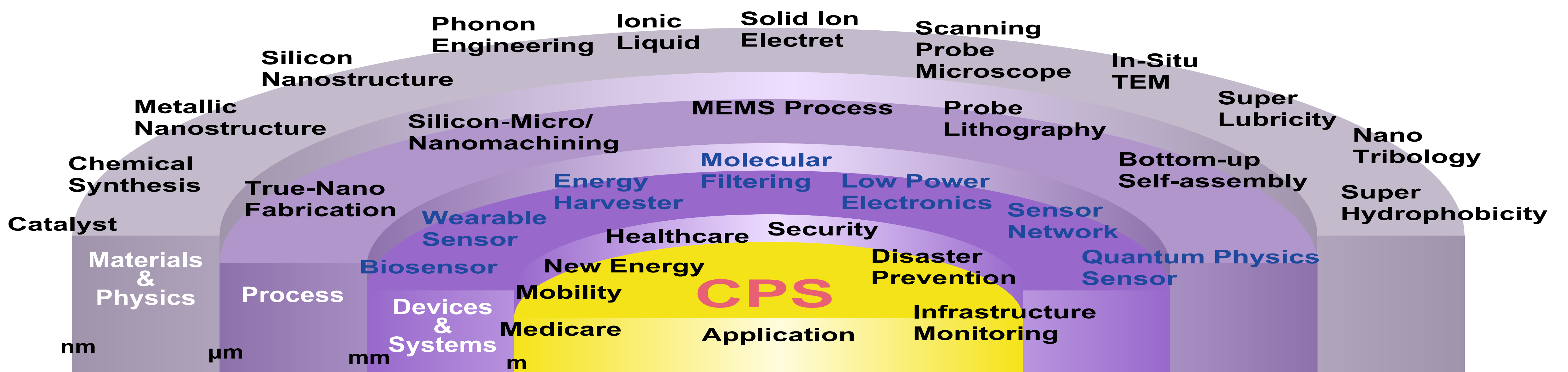
# Centre for Interdisciplinary Research on Micro-Nano Methods (CIRMM)



Materials 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

**CPS Implementation**  
 MEMS as edge computers and gateway to cloud of big data

**Nano Fabrication**  
 In-house Fab-Lab for cutting-edge manufacturing

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

**Takahashi Lab.** Dept.3 Ee-305

Nano-probing Technologies

Images of topography (left) and photovoltage (right) 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

**Toshiyoshi Lab.** Dept.3 Ee-308

MEMS/NEMS

MEMS environmental vibrational energy harvester

**Takamiya Lab.** Dept.3 Ew-206

Integrated Power Management

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

**Tixier-Mita Lab.** Dept.3 Ee-302

Bio CMOS/MEMS Platforms

Integrated 2D electronic platform for electrical interaction and manipulation of biological cells

**Nomura Lab.** Dept.3 Fe-207

Nanoscale heat transfer and thermoelectrics

Nanostructured Si thermoelectric energy harvester

**Mizoguchi Lab. affiliated member** Dept.4 Ee-312

Understanding role of atom and electron in material

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

