

FUJITA LAB.

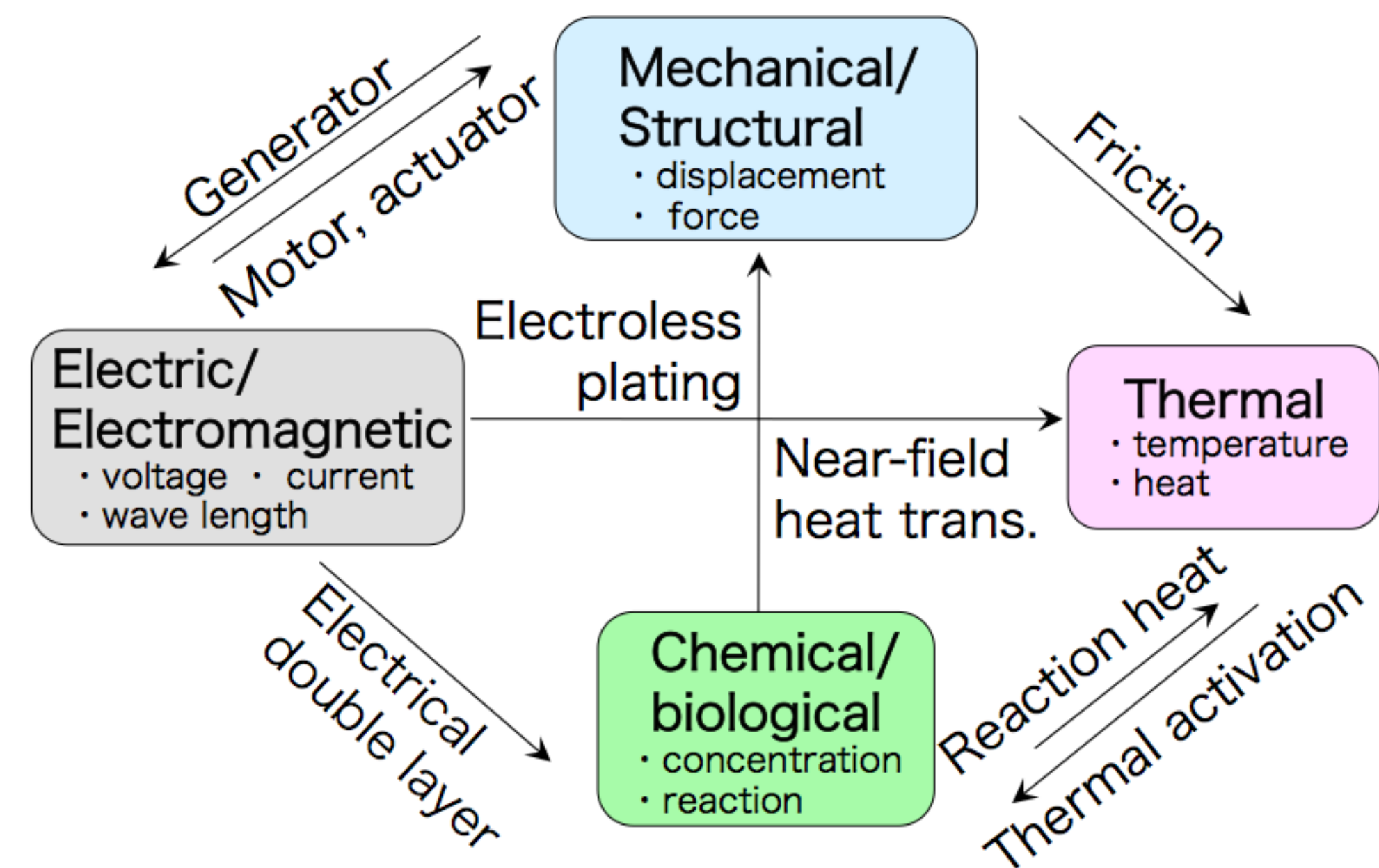
[Nano Mechatronics for Science and Industrial Technology]

Centre for Interdisciplinary Research on Micro-Nano Methods

Department of Electrical Engineering and Information Systems

<http://www.fujita3.iis.u-tokyo.ac.jp/>

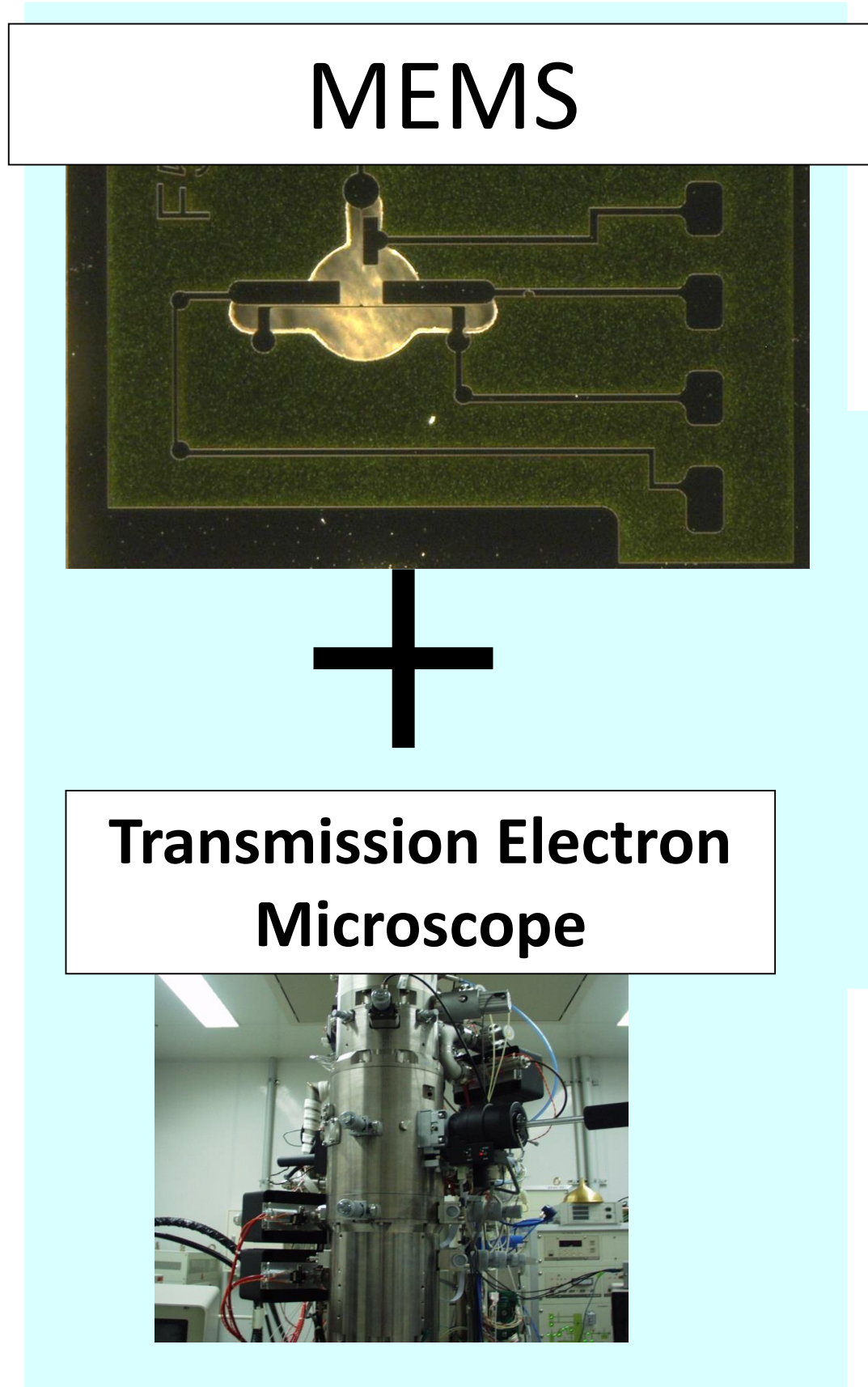
From the beginning of MEMS (Micro Electro Mechanical Systems), our group has investigated the fabrication technology and applications of MEMS in the forefront of the field. Currently we focus on MEMS application to three major research fields, "nanotechnology", "biotechnology" and "Energy harvesting". In nanotechnology, the combination between MEMS and TEM (Transmission Electron Microscope) enabled us to study nano physics under in-situ observation. In biotechnology, the combination between molecule and MEMS opened a new scientific field, which cannot be realized by bulk experiment. Also MEMS technology is applied for a novel energy harvester using ionic liquid.



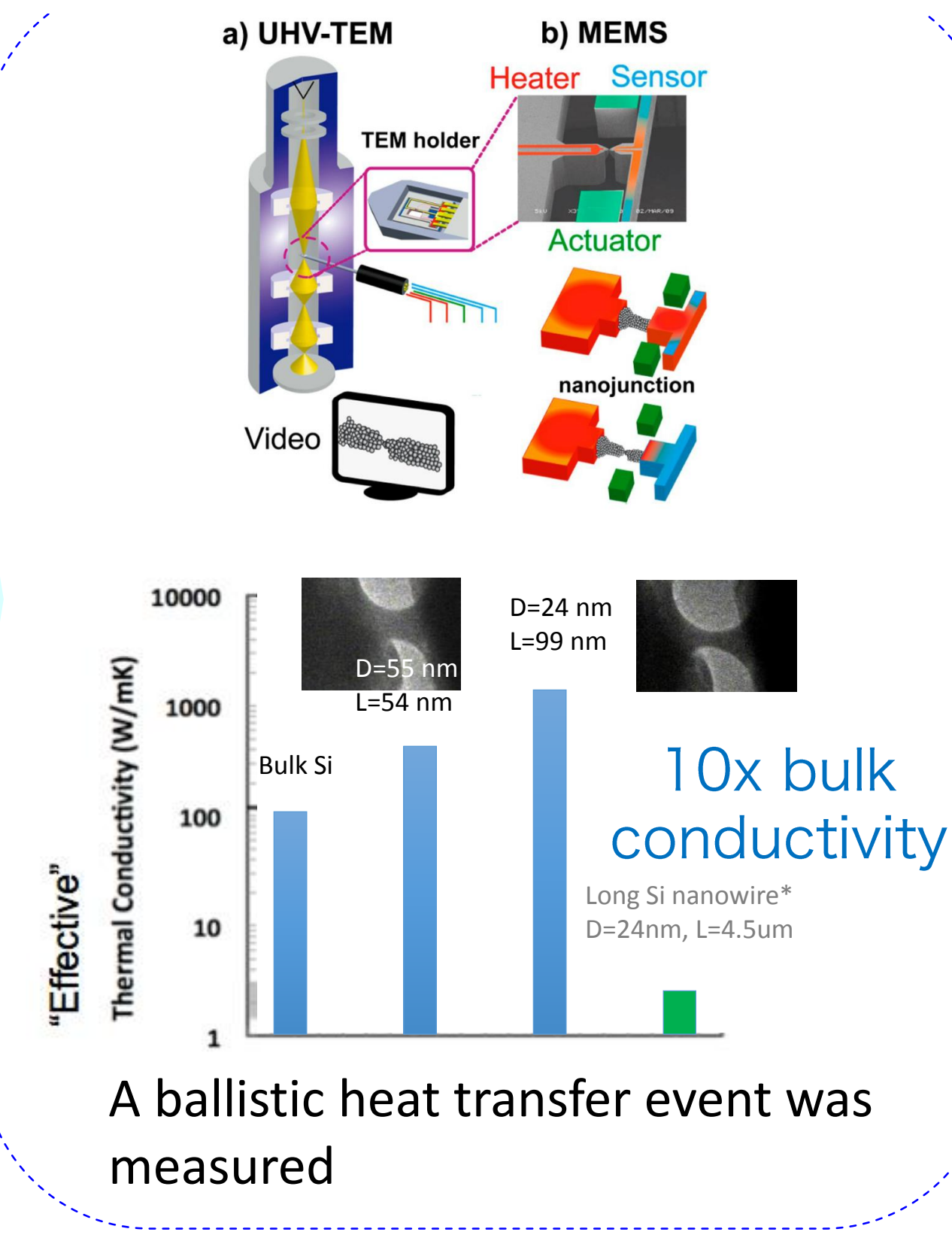
Physics in Nanoworld

We combined "MEMS opposing tips" and "TEM" with atomic resolution and real time imaging. With this setup, called MEMS-in-TEM, the formation and deformation of nano-scaled junctions were observed in-situ, while unique properties of nano structures were measured.

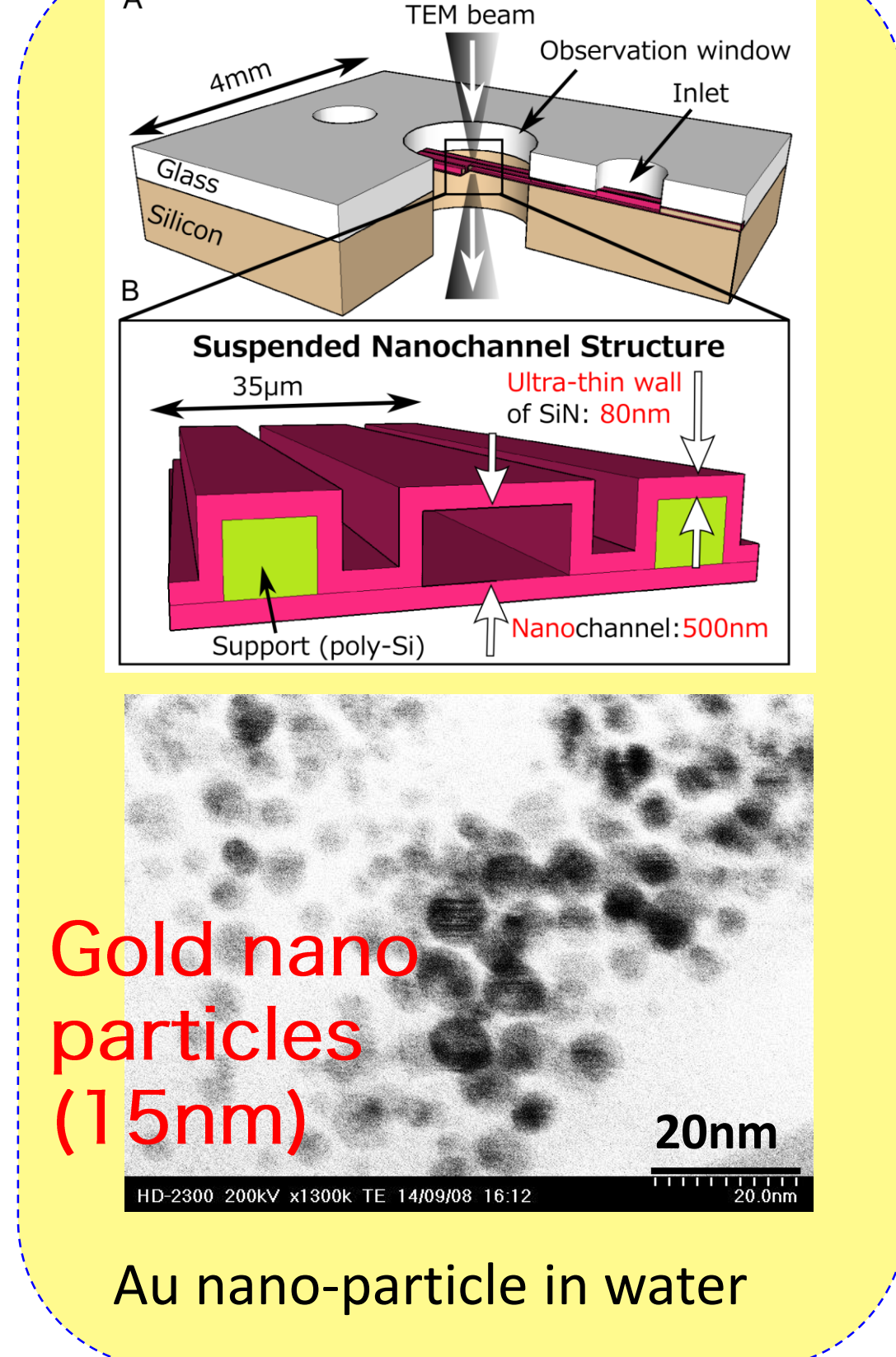
MEMS-in-TEM



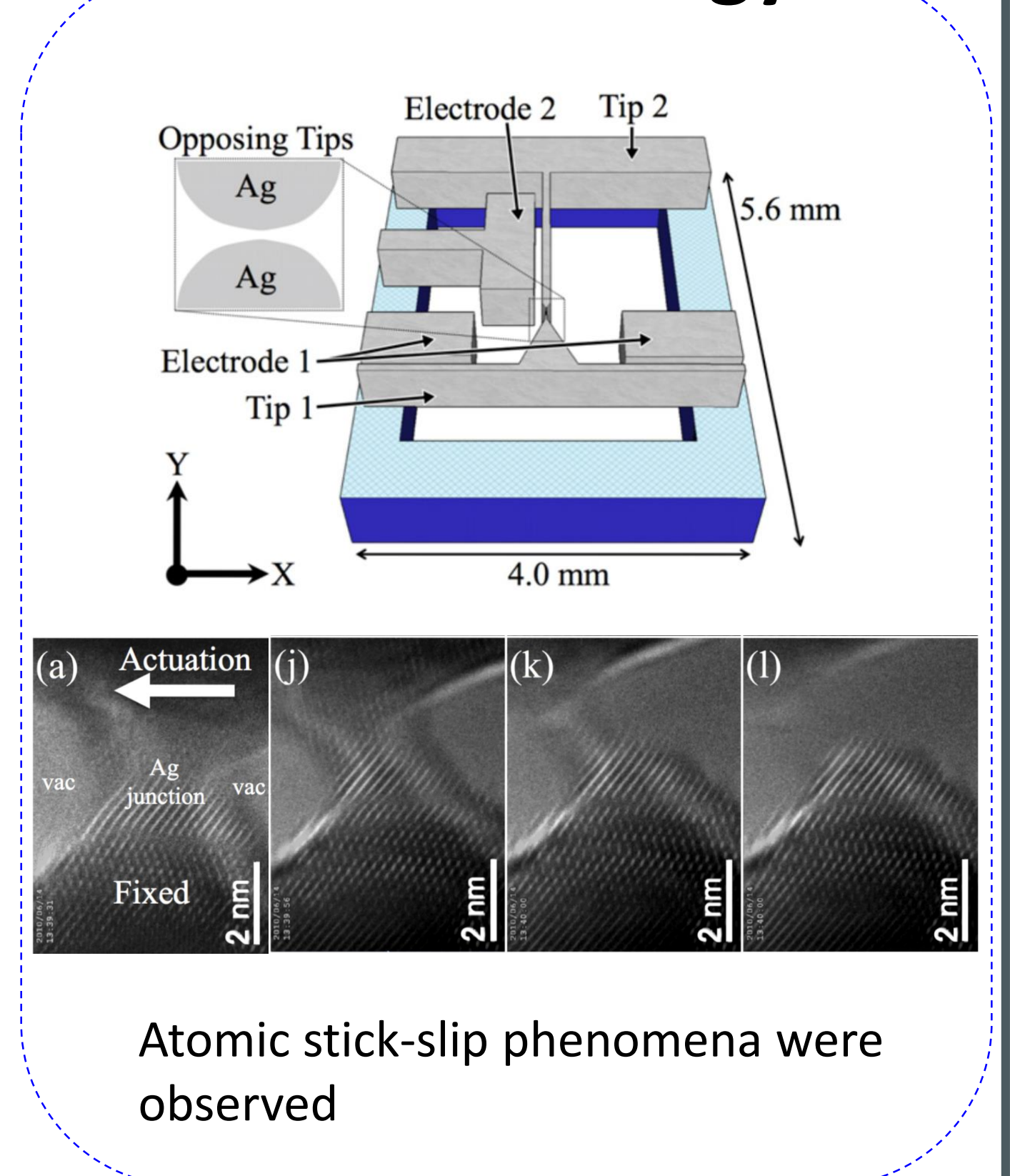
① Nano heat transfer



② Liquid cell

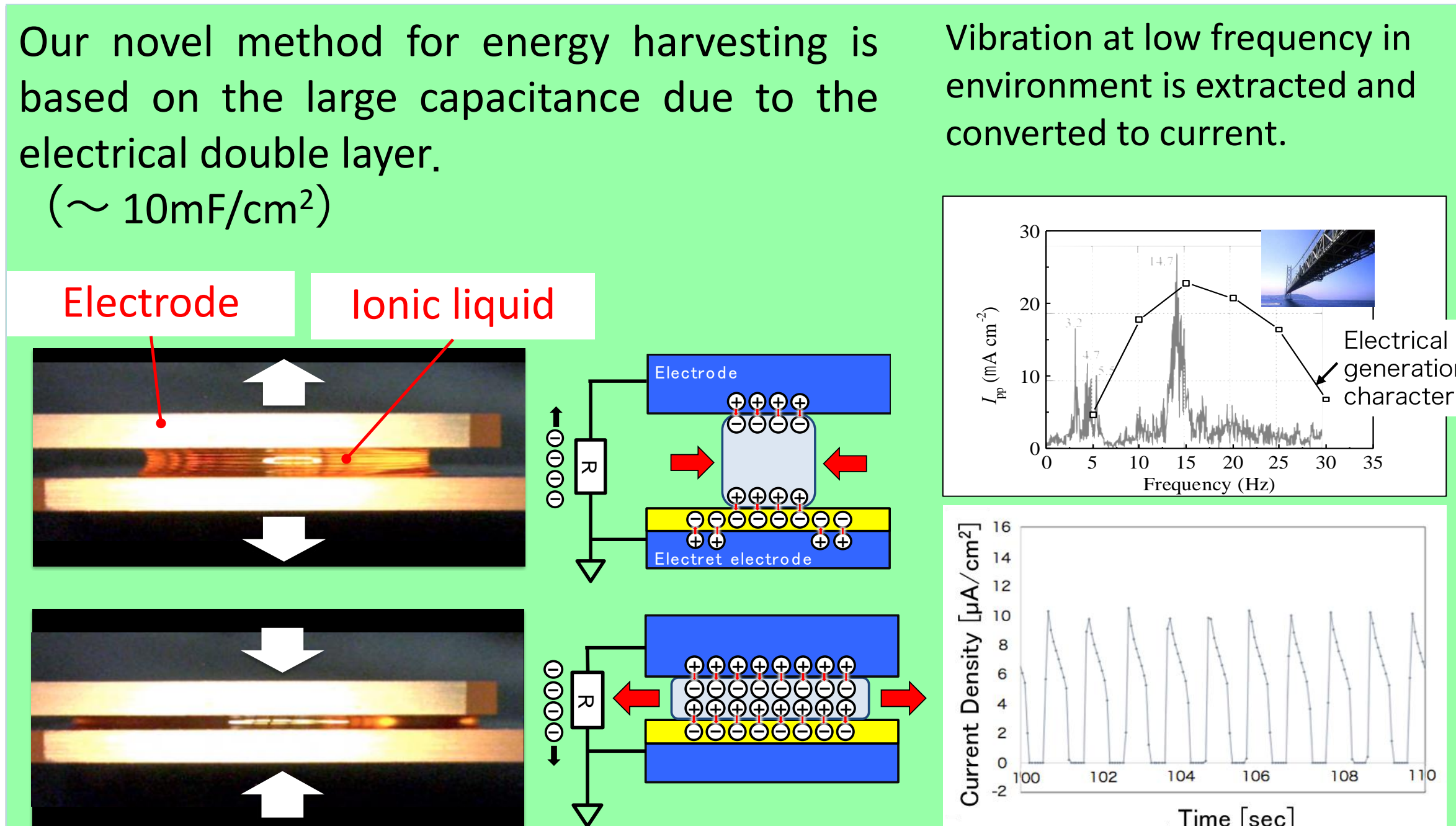


③ Nano tribology



MEMS for Energy harvesting

We are applying ionic liquids to energy harvesters for micro-sized, mechanically robust devices capable of producing large output current from low frequency vibration in the environment.



MEMS for Biological applications

Transportation and reaction measurement of ultra small bio materials, especially single molecular/ cellular level, were achieved using MEMS devices.

