



MAJIMA Lab.

Sub-10nm Scale Next Generation Molecular Transistor

Laboratory for Materials and Devices, IIR, Tokyo Tech

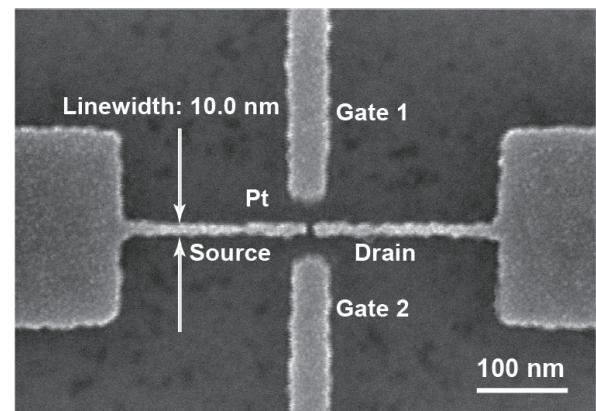
<http://www.msl.titech.ac.jp/~majima/>

- Nanogap Electrodes fabrication by Electron-Beam Lithography (EBL) and Electroless Au-Plating (ELGP)
- Molecular Transistor
- Single-Electron Transistor Circuits

Developments of next-generation transistor beyond 5nm is the key technology in the industry.

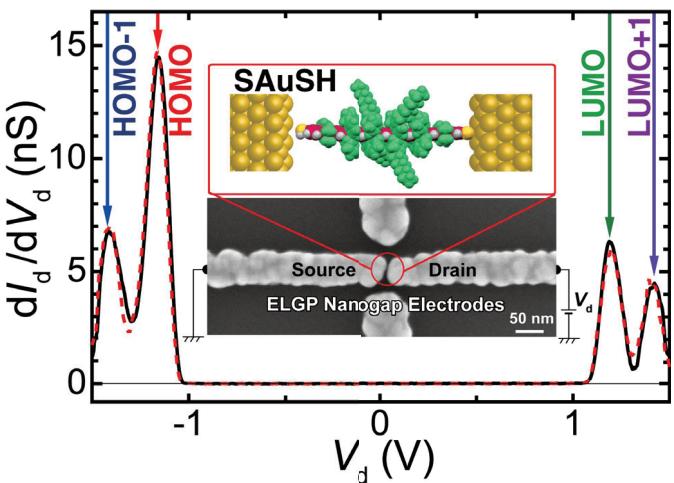
Majima lab. is now developing 3 nm transistor by combining top-down (EBL) and bottom-up (ELGP, Self-assembly).

Motto:
Originality
Execution
Realization



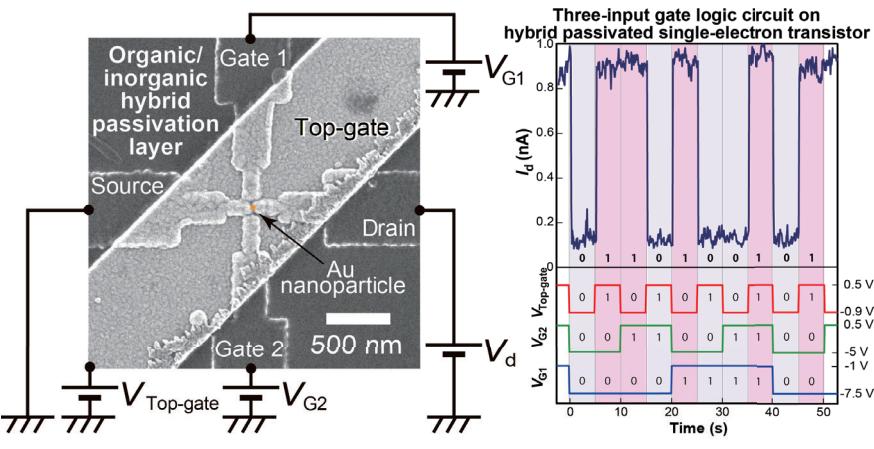
Ultrafine Pt nanogap electrodes by EBL

- Robust up to 773 K
- Gap separation control by ELGP



Resonant tunneling (RT) through long molecular wire

- RT through molecular orbital
- Long RT of 4.3nm
- Candidates of molecular transistor



3-input gates single-electron transistor (SET) logic circuit

- Au nanoparticle SET
- Organic/inorganic hybrid passivation
- 3-input XOR logic operation on a SET