

MACHIDA LAB.

[Electrons in nano]

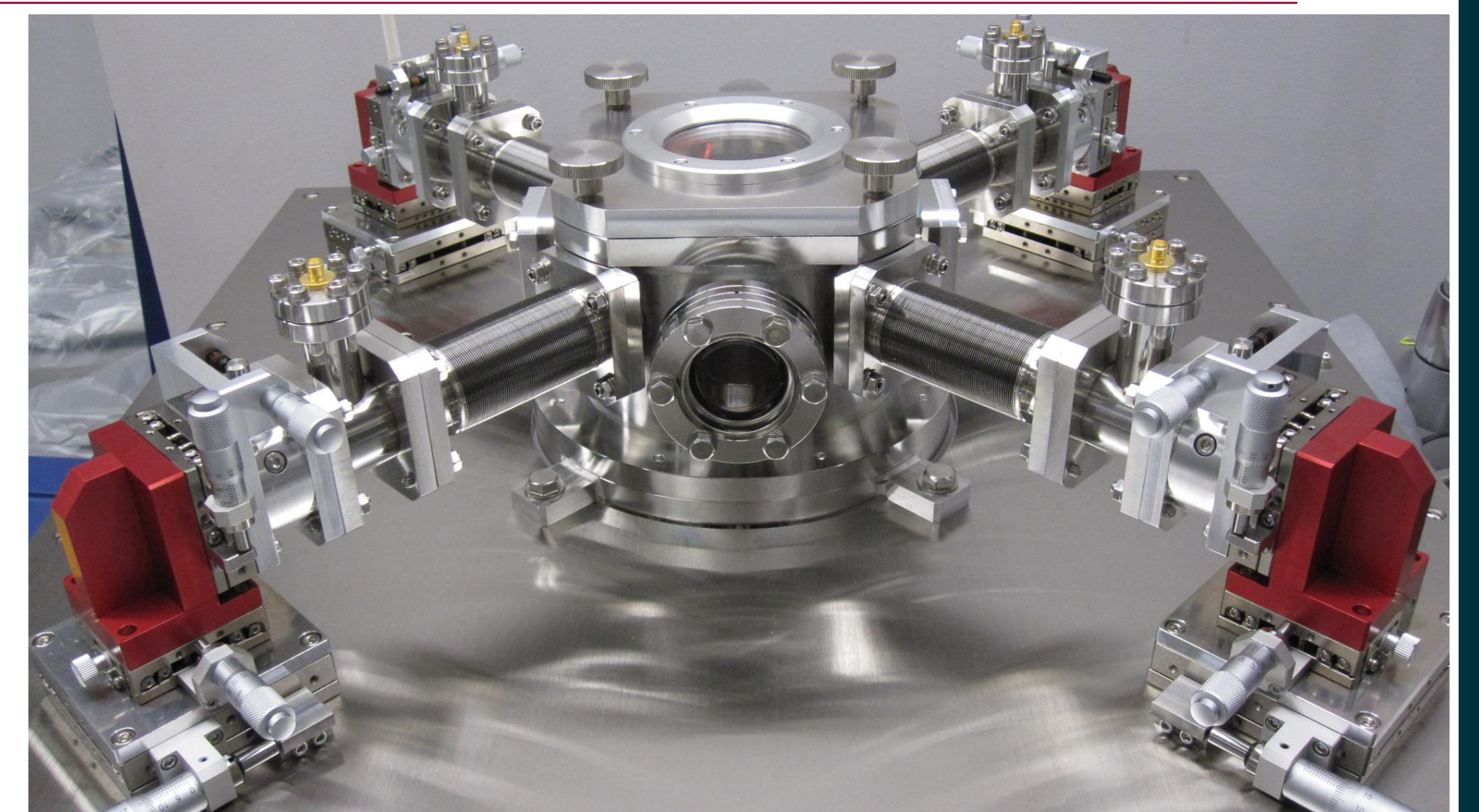
Department of Fundamental Engineering

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

Department of applied physics **Semiconductor quantum spintronics**
School of Engineering

Electrons and spins in nano-structure

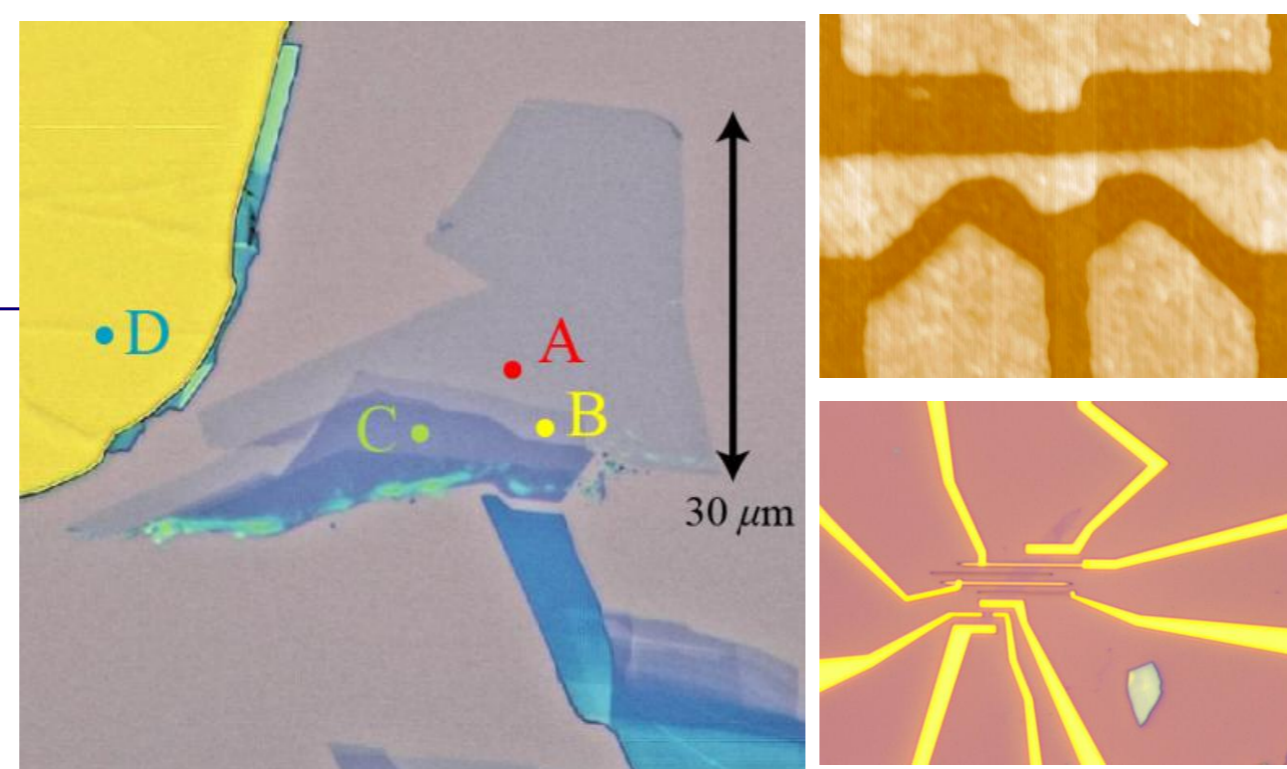
The electrons in the nano-device exhibit very different behavior. By combining material science (graphene, semiconductor, oxide), nano-fabrication, and low temperature (~ 10 mK) measurement, we explore the science and the engineering of nano-Spintronics.



RF probe station

Graphene

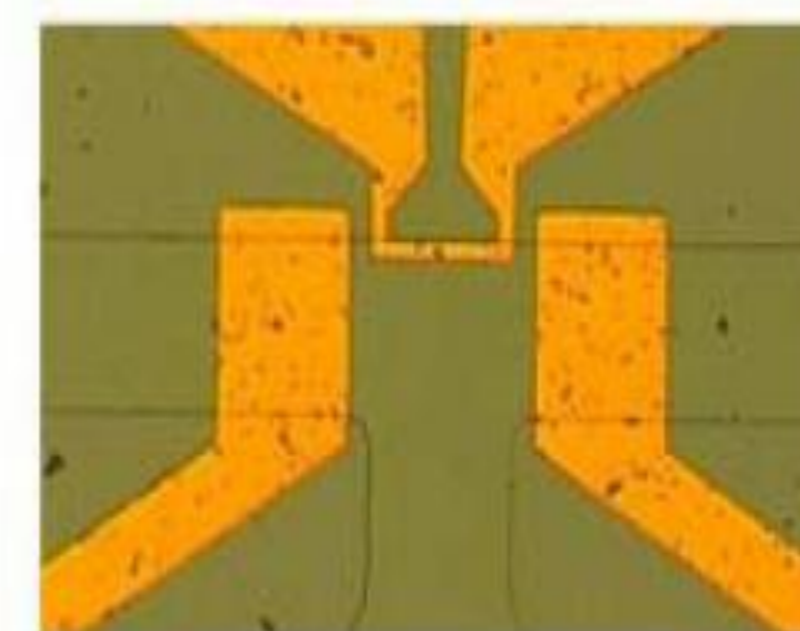
Quantum transport in Dirac fermion.



EB lithography system

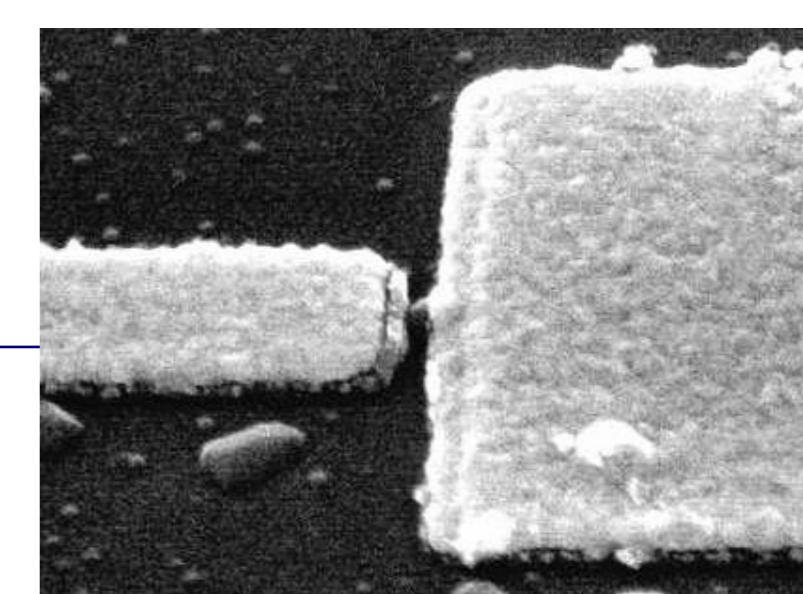
Nuclear spins in semiconductor

Quantum information processing with nuclear spins in semiconductor.



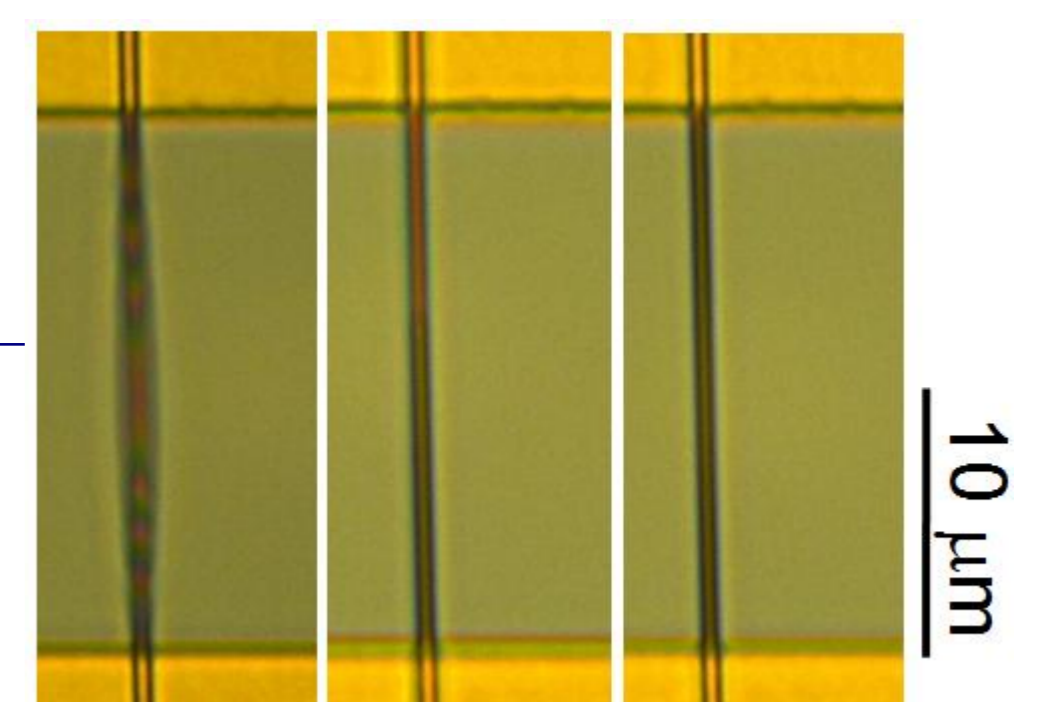
Quantum dot spin-SET

Spin single electron transistor (spin-SET) based on nanogap electrode and self-assembled InAs quantum dot (QD).



Oxide nano-wire

Physics of correlated electrons in oxide nano-wire



10 μm



10 mK Dilution refrigerator