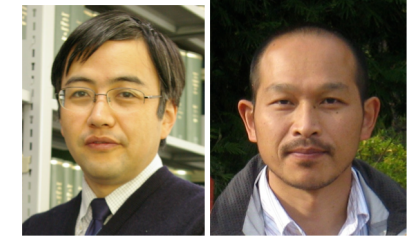


Students of Ichioka/Adachi group will obtain research abilities of microscopic theories and computational calculations to clarify/predict new phenomena of condensed matter physics.



Prof. Ichioka Prof. Adachi

## Theory of vortex/surface states of superconductivity

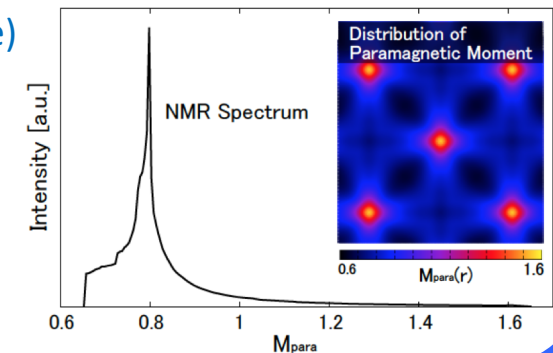
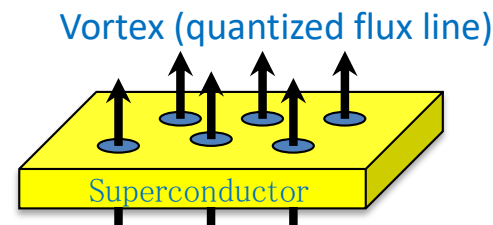
to clarify/predict new mechanism of unconventional superconductivity through the local electronic states and order parameter structures of non-uniform superconductivity.

### Physical properties under magnetic fields

Magnetic field dependence of specific heat, magnetization, STM image of local density of states, and NMR spectrum.

### Topological superconductivity

Exotic vortex-core/surface states such as Majorana states.  
Multi-component superconductivity (spin-triplet pairing, multi-band).



## Theory of novel spin transport phenomena

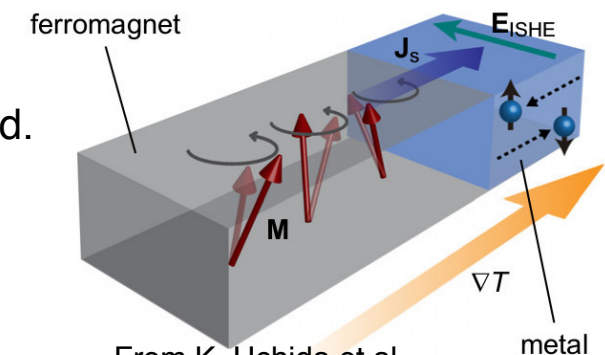
to clarify/predict new functionalities of spintronic devices using many-body theory

### Spin Seebeck effect

Spin current generation by a temperature bias (spin Seebeck effect) attracts much attention as a versatile spin injection method.

### Spin pumping

New spin injection method using microwaves (spin pumping) enables charge-free spin injection and thus has been applied to a number of exotic materials such as graphene, topological insulators, Rashba systems.



From K. Uchida et al.,  
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