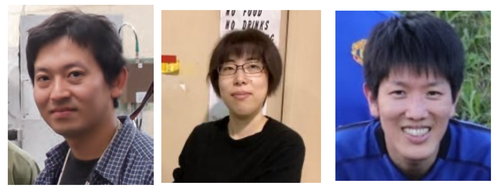
Research Group for Strongly Correlated Actinide Science

NMR

Dr. Y. Tokunaga (GL) | Dr. H. Sakai (MG) | Dr. S. Kambe

Neutron

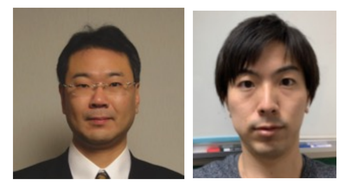


Dr. K. Kaneko | Dr. C. Tabata | Dr. Y. Hirose

Material synthesis/Physical property evaluation

Dr. Y. Haga | Dr. E. Yamamoto | Dr. Y. Tokiwa | Dr. M. Kimata | Dr. T. Kitazawa

Theory



Dr. K. Kubo | Dr. T. Ishitobi

Research subject

The discovery of new principles and materials based on materials science has led to discontinuous and dramatic technological developments that go beyond the improvements and extensions of conventional techniques and principles. Interestingly, many novel physical properties have been found in actinide materials, such as spin-triplet superconductivity and the super-giant magnetic thermoelectric effect. Therefore, actinides are essential elements not only in nuclear applications but also in materials science. Our group explores the frontier of materials science with actinides by fully using the world's leading single-crystal growth techniques and advanced measurement systems such as NMR and neutron scattering.

Condensed Matter Physics in Actinide Systems

Key concept

Actinides are unique and essential elements
not only for nuclear engineering but also for material science

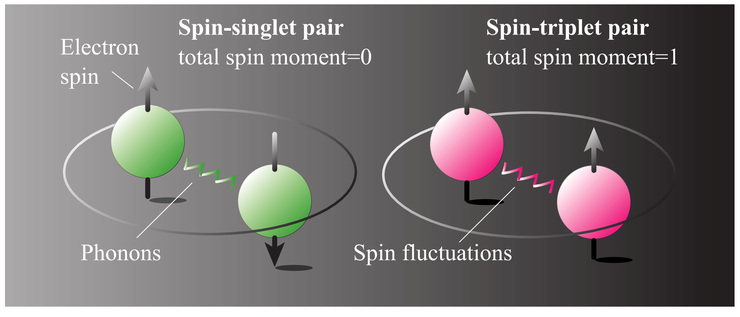
A lot of exotic electronic phenomena emerge only in actinide systems
uniqueness arising from strongly correlated 5f-electrons

Our objective

Explore new principles/materials through fundamental research on actinide systems

Potential to trigger a major innovation, and contribute to the achievement of a sustainable society

Ubiquitous



Importance for basic science 「Spin-triplet SC」

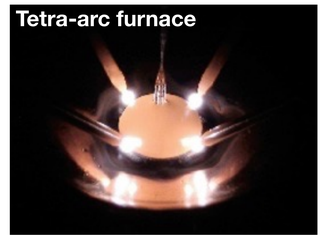
Importance for future application 「Topological SC」

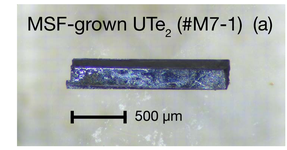
New generation quantum computing using topology

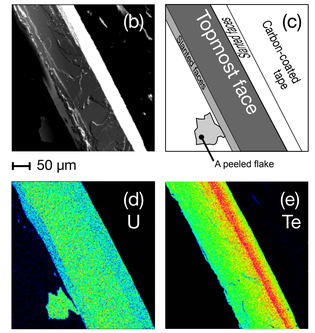
11 universities/institutes from 6 countries

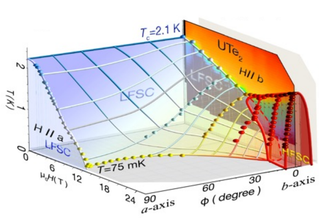
International Collaborations
leading the fundamental research on actinide materials

Materials development and single crystal growth

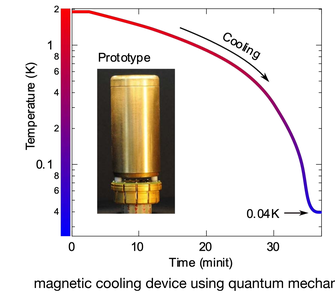




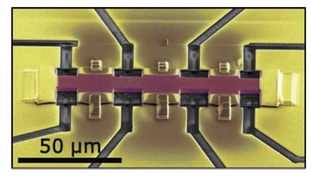




Advanced experimental devices and techniques



magnetic cooling device using quantum mechanics



False-color scanning-electron-microscope image of the FIB structured Hall-bar device of UTe_2