Research Group for Strongly Correlated Actinide Science

NMR

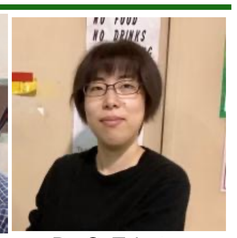

Dr. Y. Tokunaga (GL)


Dr. H. Sakai

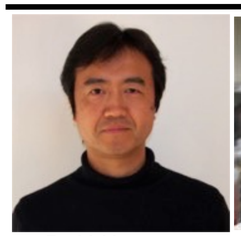

Dr. S. Kambe

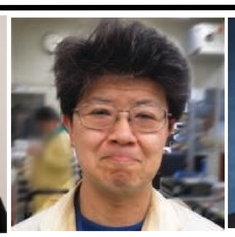
Neutron


Dr. K. Kaneko

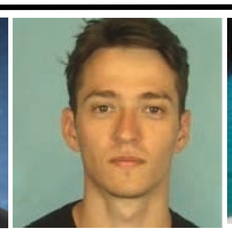

Dr. C. Tabata

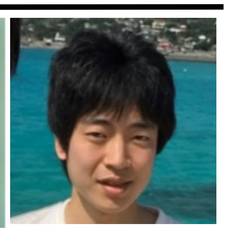
Material synthesis/Physical property evaluation


Dr. Y. Haga


Dr. E. Yamamoto


Dr. Y. Tokiwa


Dr. P. Opletal


M.S. T. Kitazawa

Theory


Dr. K. Kubo

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

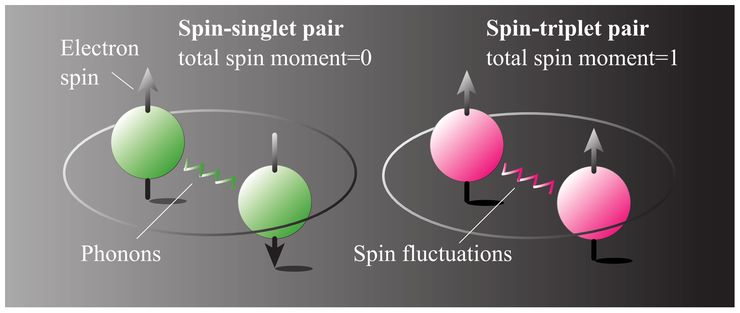
A lot of exotic electronic phenomena
emerge only in actinide systems
uniqueness arising from strongly correlated 5f-electrons

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

JAEA 2050 +



Importance for basic science 「Spin-triplet SC」

Importance for future application 「Topological SC」

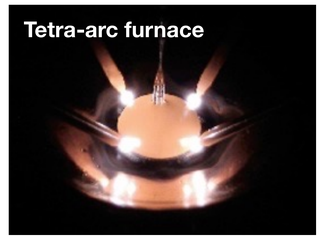
New generation quantum computing using topology

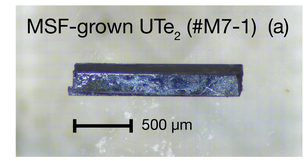
Expect dramatically improved "error resilience" technology, one of the the biggest issue for quantum computers

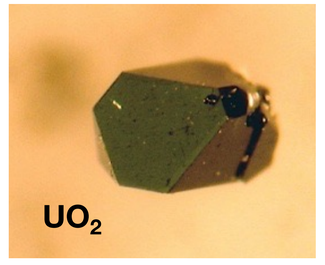
11 universities/institutes from 6 countries

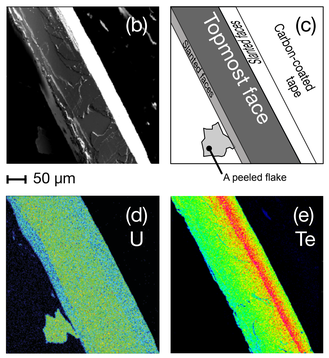
International Collaborations
leading the fundamental research
on actinide materials

Materials development and single crystal growth

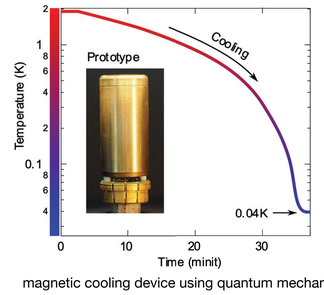




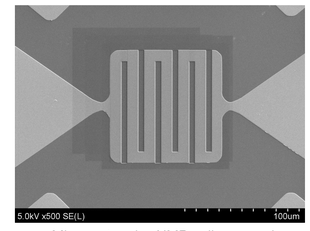




Advanced experimental devices and techniques



magnetic cooling device using quantum mechanics



Micrometer-size NMR coil prepared
by using FIB