## 物性研究所談話会

標題: The unusually resilient unconventional superconductor Sr2RuO4

日時: 2023年10月19日(木)午後4時

場所:柏図書館メディアホール 講師:Manfred Sigrist 氏

要旨:

Despite extensive research, Sr2RuO4 has remained an enigmatic unconventional superconductor for nearly three decades. Initially categorized as a prime example of a chiral spin-triplet superconductor, doubts regarding this classification only emerged four years ago when evidence for spin-singlet pairing appeared. This unexpected shift has introduced a significant conundrum as the newly proposed spin-singlet nature presents considerable new obstacles in establishing a pairing symmetry that aligns with the wealth of existing experimental data.

This colloquium aims to provide an overview of the current challenges in harmonizing theoretical perspectives with present state of experimental reality.

## 【講師紹介】

Sigrist 教授は異方的超伝導体をはじめとする強相関電子系に関する研究で世界的に著名な理論家です。特に、前野グループが発見した Sr2RuO4 の超伝導について、T. M. Rice 教授と共にカイラル p 波状態を提唱し、関連する多くの研究に大きな影響を与えました。Sr2RuO4 に関する研究は最近の実験結果によって新しい局面を迎えています。

このテーマの研究を最初期からリードされている専門家に、最近の実験結果も踏まえた総括をしていただきました。

標題:令和5年度後期 客員所員講演会

日時: 2023 年 12 月 14 日(木) 午前 11 時~午後 0 時場所: 物性研究所 6 階大講義室(A632)・Hybrid 開催

講師:Oliver Portugall

講演題目:" Experimental techniques for Megagauss fields: status and perspectives"

## 要旨:

Magnetic fields are an important tool for investigating the charge and spin states of matter. Increasing the field strength can either just amplify a given phenomenon, or give rise to the complete transformation of a system's electronic and magnetic structure. Perhaps the most prominent example for such a threshold effect are high-Tc superconductors where applying the strongest available fields is mandatory to suppress superconductivity and investigate the underlying normal state.

The generation of high magnetic fields in a finite volume is fundamentally limited by the necessity to contain the respective magnetic energy. Above 100 T this can only be done dynamically, i.e. for a very short time that depends on the confining magnet's inertia. Megagauss fields are therefore intrinsically limited to microsecond durations. In recent years, this limitation has lost much of its dread due to advances in radio-frequency and high-speed, high-resolution digitization techniques. However, performing Megagauss experiments still remains challenging due to thermal and mechanical side-effects caused by the magnet's ultimate explosion, and the inevitable use of pulsed power techniques that expose sensitive measurement equipment to transient electromagnetic disturbances.

In this talk I will present the scientific objectives and current status of projects aiming at the implementation of THz-spectroscopy and RF-electric transport measurements in Toulouse, as well as ongoing developments to improve the general experimental conditions in Megagauss fields. In this connection I will also comment on the collaborative effort involving the Megagauss groups in Kashiwa and Toulouse, as well the European Magnetic Field Laboratory.

物性研だより第63巻第4号