



IFMP Seminar

Date Friday, June 28, 2024, at **09:50** (Note special day, time!)

REC/D016 (Note special room!)

BigBlueButton: <https://bbb.tu-dresden.de/b/dar-mbs-me8-gsc>

Speaker **Yoshihiko Ihara**

Hokkaido University, Sapporo, Japan

Title **Multi-site NMR study for band-dependent gap in itinerant kagome magnet $\text{Sc}_3\text{Mn}_3\text{Al}_7\text{Si}_5$**

Abstract The recent discovery of kagome superconductor CsV_3Sb_5 [1] expands the interest in kagome network-based materials from promising spin liquid candidates [2] to exotic metals with a characteristic band structure which hosts flat bands, van Hove singularities, and Dirac points. To incorporate quantum magnetism in this exotic metal, we focus on the metallic kagome compound with significantly enhanced magnetism, $\text{Sc}_3\text{Mn}_3\text{Al}_7\text{Si}_5$ [3]. Mn 3d electrons are responsible for both the magnetism and conductivity, establishing itinerant magnetism on the kagome network. The metallic resistivity levels off below 50 K and shows a slight increase at lower temperatures, suggesting a nontrivial ground state. However, no anomaly was found in the magnetization. To reveal the electronic properties in the ground state, we performed NMR measurements for two different nuclear sites — Mn and Al — and detected a gap opening below 10 K on part of the Fermi surface, most probably at the van Hove singularity. In this presentation, I will discuss the possibility of field tuning of the Fermi energy with respect to the van Hove singularity.

[1] B. R. Ortiz, *et al.*, Phys. Rev. Mater. **3**, 094407 (2019).

[2] L. Balents, Nature **464**, 199–208 (2010).

[3] H. He, *et al.*, Inorg. Chem. **53**, 9115–9121 (2014).

Host: D. Peets