2nd Workshop on Muon Science Technology and Industry (MELODY2025)

Report of Contributions

https://indico.ihep.ac.cn/e/melody2025

Contribution ID: **1** Type: **not specified**

Overview of the muon facility MLF J-PARC (MUSE)

Friday, 10 January 2025 09:00 (25 minutes)

Presenter: KAWAMURA, Naritoshi (J-PARC)

Session Classification: Facilities

Contribution ID: **2** Type: **not specified**

ISIS

Friday, 10 January 2025 08:35 (25 minutes)

Presenter: HILLIER, Adrian (ISIS)

Session Classification: Facilities

Contribution ID: **3** Type: **not specified**

TRIUMF (online)

Friday, 10 January 2025 10:40 (25 minutes)

Presenter: KOJIMA, Kenji (TRIUMF)

Session Classification: Facilities

Contribution ID: **4** Type: **not specified**

MuSIC

Friday, 10 January 2025 10:15 (25 minutes)

Presenter: SATO, Akira (Osaka University)

Session Classification: Facilities

Contribution ID: **5** Type: **not specified**

CSNS-II MELODY

Friday, 10 January 2025 09:25 (25 minutes)

Presenter: BAO, Yu (CSNS)

Session Classification: Facilities

Contribution ID: **6** Type: **not specified**

Spin-Liquid in Geometrically Frustrated Kagome Lattice Investigated by Muon Spin Relaxation and Neutron Scattering

Friday, 10 January 2025 16:25 (20 minutes)

Presenter: ADROJA, Devashibhai (ISIS)

Session Classification: μSR applications

Contribution ID: **7** Type: **not specified**

μSR Signatures of Pseudogap and Critical Spin Dynamics in the Kondo Condensate of P-Doped Silicon

Friday, 10 January 2025 16:05 (20 minutes)

Doped silicon offers a rich platform for exploring quantum many-body phenomena arising from the interplay of spatial inhomogeneity, magnetism, and electron correlations. At intermediate densities of magnetic impurities, phosphorus-doped silicon (Si:P) hosts a Kondo condensate, characterized by an energy gap in the electronic density of states. In this regime, randomly distributed Kondo clouds overlap and interact via Ruderman–Kittel–Kasuya–Yoshida (RKKY) interactions, yet the precise nature of its magnetic ground state remains unresolved. In this talk, I will present our study of the magnetic ground state and spin dynamics of Si:P using electron and muon spin resonance (ESR and μSR). The ESR data reveal a gradual crossover from the Korringa regime to the spin-fluctuation regime between 22 K and 150 K, with the development of Kondo-singlet fluctuations below 22 K, eventually leading to the formation of Kondo singlets below 6 K. Complementary μSR results indicate that Kondo singlets with a singlet gap Δ_{ZF} = 0.8(4) K emerge below T_{K} = 2.4 K, followed by the formation of a correlated Kondo state at T^{*} = 0.6 K, characterized by a power-law dependence, $-K_{\mu}T \sim T^{\xi}$. This Kondo condensate state exhibits a coexistence of a Bardeen-Cooper-Schrieffer-like charge gap and critical magnetic fluctuations, drawing striking parallels to the pseudogap phases observed in doped Mott insulators. These findings extend the scope of pseudogap phenomena, highlighting their relevance in the domain of doped semiconductors.

Presenter: CHOI, Kwang-Yong (Sungkyunkwan University, Republic of Korea)

Session Classification: μSR applications

Contribution ID: **8** Type: **not specified**

Probing the penetration depth of superconductors using muon-spin rotation and the tunnel diode technique

Saturday, 11 January 2025 09:40 (20 minutes)

Presenter: SMIDMAN, Michael (Zhejiang University)

Session Classification: μSR applications

Contribution ID: **9** Type: **not specified**

Magnetic phase evolution of a Kagome magnet Co3(Sn2-xInx)S2 and related diluted magnetic semiconductors

Saturday, 11 January 2025 10:00 (20 minutes)

Presenter: ZHAO, Guoqiang (Kavli Institute for Theoretical Sciences, UCAS)

Session Classification: μSR applications

Contribution ID: **10** Type: **not specified**

Searching for broken symmetries in superconductors with muons

Saturday, 11 January 2025 09:00 (20 minutes)

Presenter: LUKE, Graeme (McMaster University)

Session Classification: μSR applications

Contribution ID: **11** Type: **not specified**

μSR studies of Kagome magnets (Fe,Co)Sn

Saturday, 11 January 2025 10:20 (20 minutes)

Presenter: CAI, Yipeng (Columbia University)

Session Classification: μSR applications

Contribution ID: **12** Type: **not specified**

Quantum Critical Behavior in Rare-Earth Compound Studied by μSR

Friday, 10 January 2025 14:45 (20 minutes)

Presenter: HIGEMOTO, Wataru (JAEA)

Session Classification: μSR applications

Contribution ID: **13** Type: **not specified**

Muon spin rotation applied to superconducting and magnetic materials

Friday, 10 January 2025 14:25 (20 minutes)

Presenter: CHANG, Johan (University of Zurich)

Session Classification: μSR applications

Contribution ID: **14** Type: **not specified**

Superconductivity research with muons

Friday, 10 January 2025 15:05 (20 minutes)

Presenter: STEWART, Rhea (ISIS)

Session Classification: μSR applications

Contribution ID: **15** Type: **not specified**

Search for exotic magnetic phases with μSR

Saturday, 11 January 2025 15:30 (20 minutes)

Presenter: GRINENKO, Vadim (Shanghai Jiao Tong University)

Session Classification: μSR applications

Contribution ID: **17** Type: **not specified**

μSR studies on the Ruddlesden-Popper phase and others

Saturday, 11 January 2025 15:10 (20 minutes)

Presenter: GUO, Hanjie (松山湖材料实验室)

Session Classification: μSR applications

Contribution ID: **18** Type: **not specified**

The Application of MuSR on the Study of Quantum Materials

Friday, 10 January 2025 11:05 (20 minutes)

Presenter: SHU, Lei (Fudan University)

Session Classification: μSR applications

Contribution ID: **19** Type: **not specified**

Neutron scattering and muSR study on the QSL behavior of Pr2Ga2BeO7

Friday, 10 January 2025 16:45 (20 minutes)

Presenter: MA, Jie (Shanghai Jiao Tong University)

Session Classification: μSR applications

Contribution ID: **20** Type: **not specified**

μSR investigation of novel magnetic semiconductors

Saturday, 11 January 2025 09:20 (20 minutes)

Presenter: NING, Fanlong (Zhejiang University)

Session Classification: μSR applications

Contribution ID: **21** Type: **not specified**

MIXE

Saturday, 11 January 2025 14:00 (20 minutes)

Presenter: TOMONO, Dai (Osaka University)

Session Classification: Negative muon

Contribution ID: **22** Type: **not specified**

Negative muons and industry (online)

Saturday, 11 January 2025 11:40 (20 minutes)

Presenter: GHANDI, Khashayar (University of Guelph)

Session Classification: Negative muon

Contribution ID: **23** Type: **not specified**

Elemental analysis using muon induced X-rays at J-PARC (online)

Saturday, 11 January 2025 14:40 (20 minutes)

Presenter: TAMPO, Motonobu (J-PARC)

Session Classification: Negative muon

Contribution ID: **24** Type: **not specified**

Negative muon beamline and applications (online)

Friday, 10 January 2025 11:25 (20 minutes)

Presenter: TAKESHITA, Soshi (KEK/J-PARC)

Session Classification: Negative muon

Contribution ID: **25** Type: **not specified**

μSR instruments at J-PARC

Saturday, 11 January 2025 16:15 (20 minutes)

Presenter: KODA, Akihiro (J-PARC)

Session Classification: Technology and more

Contribution ID: **26** Type: **not specified**

Software Development for μSR Experiment at J-PARC (online)

Saturday, 11 January 2025 16:35 (20 minutes)

Presenter: NISHIMURA, Shoichiro (J-PARC)

Session Classification: Technology and more

Contribution ID: **27** Type: **not specified**

Muon users' society in Japan

Friday, 10 January 2025 11:45 (20 minutes)

Presenter: SHIMOMURA, Koichiro (J-PARC)

Session Classification: Technology and more

Contribution ID: **28** Type: **not specified**

Development of muon imaging by accelerator muons at J-PARC MUSE

Saturday, 11 January 2025 17:15 (20 minutes)

Presenter: MIYAKE, Yasuhiro (J-PARC)

Session Classification: Technology and more

Contribution ID: **29** Type: **not specified**

Muons and life sciences (online)

Friday, 10 January 2025 15:25 (20 minutes)

Presenter: PANT, Amba (J-PARC)

Session Classification: μSR applications

Contribution ID: **30** Type: **not specified**

Negative muons for energy material (online)

Saturday, 11 January 2025 14:20 (20 minutes)

Presenter: UMEGAKI, Izumi (J-PARC)

Session Classification: Negative muon

Contribution ID: **31** Type: **not specified**

µSR software at ISIS

Saturday, 11 January 2025 16:55 (20 minutes)

Presenter: PRATT, Francis (ISIS)

Session Classification: Technology and more

Contribution ID: **32** Type: **not specified**

Negative Muons for Heritage Science: background and applications

Saturday, 11 January 2025 11:00 (20 minutes)

Presenter: CATALDO, Matteo (INFN Bicocca)

Session Classification: Negative muon

Contribution ID: **33** Type: **not specified**

μSR study on the van der Waals cluster magnet Nb3Cl8

Saturday, 11 January 2025 15:50 (15 minutes)

Presenter: YANG, Lin (中国科学院物理研究所)

Session Classification: μSR applications

Contribution ID: **36** Type: **not specified**

Archaeological artefacts: probing deep beneath the surface

Saturday, 11 January 2025 11:20 (20 minutes)

Presenter: BISWAS, Sayani (ISIS)

Session Classification: Negative muon

Contribution ID: **37** Type: **not specified**

Update on the SμS facility at PSI (online)

Friday, 10 January 2025 14:00 (25 minutes)

Presenter: LUETKENS, Hubertus (PSI)

Session Classification: Facilities

Contribution ID: **38** Type: **not specified**

Evidence of spin density waves in La3Ni2O7-δ

Friday, 10 January 2025 17:25 (15 minutes)

Presenter: WANG, Ying (Fudan University)

Session Classification: μSR applications

Contribution ID: **39** Type: **not specified**

Magnetism & Ion Diffusion in Low-Dimensional Materials Studied by Neutron, Muons & X-rays

Friday, 10 January 2025 17:05 (20 minutes)

Presenter: MÅNSSON, Martin (KTH Royal Institute of Technology)

Session Classification: μSR applications

Contribution ID: **40** Type: **not specified**

Welcome from Director of CSNS

Friday, 10 January 2025 08:25 (5 minutes)

Presenter: WANG, Sheng (高能所)

Session Classification: Opening

Contribution ID: **41** Type: **not specified**

Welcome from MELODY

Friday, 10 January 2025 08:30 (5 minutes)

Presenter: BAO, Yu

Session Classification: Opening