

Unit Name

Quantum Materials Science Unit
Associate Professor Yoshinori Okada

Collaborations

(1) Junta Igarashi (2) Ryuhei Kono, (1) The National Institute of Advanced Industrial Science and Technology (2) Tohoku University, Japan, 新規磁性材料の総合評価と機能探索

Takeshi Kondo, The University of Tokyo, Japan, Photoemission Experiments

Anjan Soumyanarayanan, Agency for Science, Technology and Research (A-Star), Singapore, Magnetic Imaging

Takayuki Harada, National Institute for Materials Science, Japan, Oxide electronics

Daichi Chiba, Ryuhei Kono, International Center for Synchrotron Radiation Innovation Smart (SRIS), Tohoku University, Japan, Nanoelastronics

(1) Feng-Chuan Chuang (2) Hsin Lin (1) National Sun Yet-sen University (2) Academia Sinica, Taiwan, First Principle Calculations

Yasuhiro Niimi, Osaka University, Japan, Device Fabrication

Research Personnel

Chia Hsiu Hsu, Postdoctoral Scholar

Ryan Brady, Research Unit Technician

Chandan De, Postdoctoral Scholar

Tomonori Nakamura, Postdoctoral Scholar

Takemi Kato, JSPS Research Fellow

Ian Ray Lyons, PhD Student

Dyon van Dinter, PhD Student

Hirokazu Sato, PhD Student

Nanami Tomoda, (Inter-Unit) Phd Student

Kaede Kawaguchi, (Inter-Unit) Phd Student

Roger Simon de Febrer, (Inter-Unit) Phd Student

Talib Farziev, Research Intern

Kaito Morishita, Research Intern

Tomo Higashihara, Research Intern

Kangping Li, Research Intern

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Fujisawa, Y., Krishnadas, A., Hsu, C.H., Takeda, T., Liu, S., Pardo-Almanza, M., Obata, Y., Van Dinter, D., Nakamura, T., Yamagami, K., Chang, G., Kobayashi, M., Kuo, C.Y., Okada, Y.
Frustration-driven correlated parent states in the spinel superconductor LiTi₂O₄.
Physical Review Research Vol.8, Iss.1, Feb. 2026
DOI: <https://doi.org/10.1103/q3xq-6p5f>
2. Huh, S., Kawaguchi, K., Haze, M., Hasegawa, Y., Dong, Y., Aido, K., Harasawa, A., R.M. Smith, B., Yamagami, K., Fujisawa, Y., Hsu, C.H., Kuroda, K., Shin, H.J., Seo, J.Y., Lee, N., Choi, Y.J., Kinoshita, Y., Tokunaga, M., Hashimoto, M., Lu, D., Okada, Y., Kondo, T.
Observation of a d-orbital flat band near the Fermi level realizing a Kondo lattice in a van der Waals material
communications materials 7, Article number 23, December 2025
<https://doi.org/10.1038/s43246-025-01037-1>
3. Khalid, M. I., Bojanowski, N. M., De Febrer, R. S., Onishi, T., Xu, X., Okada, Y., Narita, A.
Synthesis and Two-Dimensional Chiral Self-Assembly of Oxygen-Incorporated Dibenzo[hi,st]ovalene
Organic Letters, Vol.27, Iss.42, October 2025
<http://10.1021/acs.orglett.5c03676>
4. Sun, S., Li, Q., Onishi, T., Goudappagouda; Zhou, H., Gao, L., Okada, Y., Lu, J., Narita, A., Cai, J.
On-Surface Synthesis of Nanographenes Through Domino Cyclization Reactions
Angewandte Chemie International Edition, Vol.64, Iss.28, April 2025
<https://doi.org/10.1002/anie.202425167>
5. Krishnadas, A., Fujisawa, Y., Pardo-Almanza, M., Obata, Y., Yamagami, K., Okada, Y.
Significant electron filling imbalance between chains and planes at the Surface of Ca-doped YBa₂ Cu₃ O_{7-x} Films
Physical Review B, Vol.111, Iss.20, May 2025
DOI: <https://doi.org/10.1103/PhysRevB.111.205113>

Presentation at Conference

1. Okada, Y.
Visualizing Rich Electronic Emergence in Antiferromagnetic vdW Metals, Semimetals, and Semiconductors. Annual Meeting of the Japan Society of Vacuum and Surface Science 2025
Tsukuba, Japan, 20-23 October 2025.
2. Okada, Y.
量子的複雑性の顕在化がもたらす2次元強相関係の新奇創発現象
The 3rd Nanoelastronics Workshop, OIST, Japan, 19-21 October 2025.
3. Okada, Y.
Rich Electronic Emergence in Antiferromagnetic vdW Metals, Semimetals, and Semiconductors
LANL-UMichi Joint Workshop on Quantum Materials, NM, USA, 30 June - 03 July 2025.

Seminars

1. Okada, Y.
量子的複雑性の顕在化がもたらす2次元強相関係の新奇創発現象
JST, 7-8 October 2025
Tsukuba, Japan, 20-23 October 2025

2. Okada, Y.

2次元強相関係の新奇創発現象の探索

PRESTO, Kick-off Meeting, Shonan, Japan, 7-8 October 2025

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher
Nanami Tomoda	Poster Presentation at Conference	時間分解 ARPES を用いた 2次元反強磁性体の電子状態イメージング	The 3rd Nanoelastronics Workshop, OIST, Japan, 19-21 Oct.	SRIS
Kaede Kawaguchi	Poster Presentation at Conference	有機半導体分子界面を利用したスピネル型酸化物超伝導体 LiTi2O4 の臨界温度制御	The 3rd Nanoelastronics Workshop, OIST, Japan, 19-21 Oct.	SRIS
Tomonori Nakamura	Poster Presentation at Conference	Growth mode of Tellurium on LiTi2O4 film	The 3rd Nanoelastronics Workshop, OIST, Japan, 19-21 Oct.	SRIS
Takemi Kato	Poster Presentation at Conference	Observation of van Hove singularity in boron honeycomb lattice	The 3rd Nanoelastronics Workshop, OIST, Japan, 19-21 Oct.	SRIS
Dyon Van Dinter	Presentation at Conference	Unconventional Charge Order in Monolayer FeSe-SrVO3 Revealed by Quasiparticle Interference	2025 JPS Annual Meeting, Hiroshima, Japan, 16-19 Sep.	The Physical Society of Japan
Takemi Kato	Presentation at Conference	Van Hove singularity and electron correlation effects on LaRh3B2 surface	2025 JPS Annual Meeting, Hiroshima, Japan, 16-19 Sep.	The Physical Society of Japan
Takemi Kato	Presentation at Conference	Field-dependent charge-density wave in a van der Waals antiferromagnet	Correlation Design Science Annual Meeting, Wako, Japan, 15-16 Dec.	RIKEN
Tomonori Nakamura	Presentation at Conference	Observation of electronic states of RTe3 by tunneling scanning microscopy	The 8th Young Members Section Meeting & Kanto Chapter 10th Anniversary Symposium, Niigata, Japan, 17-19 Apr.	The Japan Society of Vacuum and Surface Science
Takemi Kato	Presentation at Conference	Extended van Hove Singularity in Kagome-Honeycomb Superconductor	30th International Conference on Low Temperature Physics, Bilbao, Spain, 7-13 Aug.	UAM,CSIC,DIPC
Tomonori Nakamura	Presentation at Conference	In-plane-field-dependent anisotropy of quasi-particle interference in a van der Waals antiferromagnet CeTe3	2026 JPS Spring Meeting (online), 23-26 Mar.	The Physical Society of Japan
Tomonori Nakamura	Presentation at Conference	Growth of self-assembling Tellurium on LiTi2O4 film	2025 JPS Annual Meeting, Hiroshima, Japan, 16-19 Sep.	The Physical Society of Japan

Name of Unit Member	Type	Title	Outlet	Publisher
Tomonori Nakamura	Presentation at Conference	Anisotropic Quasiparticle Interference Induced by In-Plane Magnetic Fields in the Antiferromagnetic Phase of CeTe ₃	Correlation Design Science Annual Meeting, Wako, Japan, 15-16 Dec.	RIKEN
Takemi Kato	Presentation at Conference	Perpendicular magnetic field dependence of charge density waves in a van der Waals antiferromagnet CeTe ₃	2026 JPS Spring Meeting (online), 23-26 Mar.	The Physical Society of Japan

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Co-Organizers	Date
Professor Peter Wahl (University of St Andrews)	Quasiparticle Interference as a tool to understand quantum materials	C210, OIST		2026-02-13
Dr. Takashi Tsuchiya (NIMS)	In-materio Reservoir Computing Utilizing Spatiotemporal Dynamics of Ion, Electron, and Spin for Low Power Consumption Edge AI Devices	CO16, OIST		2025-12-16
Daichi Chiba(SRIS), Shintaro Ishiwatari(Osaka Univ.), Junichiro Ohe(Toho Univ.), Terumasa Tadano(NIMS), Toshiaki Morita(Osaka Univ.), Ryuhei Kono (Tohoku Univ.)	The 3rd Nanoelastronics Workshop	Conference Center Meeting Room 1, OIST	(1) International Center for Synchrotron Radiation Innovation Smart(SRIS), Tohoku Univ. (2) Institute of Scientific and Industrial Research, Osaka Univ.	2025-10-20