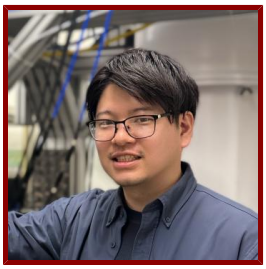
Stanford



Yusuke Iguchi

Sr Res Scientist-Physical

T. H. Geballe Laboratory for Advanced Materials

Curriculum Vitae available Online

Bio

BIO

Dr. Iguchi received his B.S. in physics at Tokyo University of Science in 2013 and received his Ph.D. in Basic Science from the University of Tokyo in 2018. Since 2018, he has worked at Stanford University with Prof. Kathryn Ann Moler. From 2018-2020, he was JSPS Overseas Fellow in Applied Physics. Since 2020, in addition to conducting his research, he has mentored students and helped to manage the group's operations as a senior research scientist in the Geballe Laboratory for Advanced Materials.

Dr. Iguchi is an experimental physicist in the field of condensed matter physics, with a focus on unconventional superconductors and non-centrosymmetric magnets. His wide-ranging research covers diverse areas, including the exploration of spin dynamics in ferromagnetic insulators and chiral edge currents in topological superconductors. His achievements include the observation of non-reciprocal magnon-propagation in chiral ferromagnets, pioneering electromagnetic control over non-reciprocal microwave propagation in multiferroic materials, uncovering local superconducting states and intrinsic magnetism in candidates for chiral superconductors, the observation of unquantized vortices in multiband superconductors, and the observation of the anomalous superfluid density potentially linked to quantum fluctuations.

Dr. Iguchi received honors and awards, including UJA Outstanding Paper Award 2024, Overseas Research Fellowship of JSPS (2018), DC2 Research Fellowship of JSPS (2016), and Outstanding Graduate Student Award from University of Tokyo (2015). In addition, He founded the Association for Japanese Researchers at Stanford University. In 2024, he joined UJA and launched the Community Launching Support as the Project Leader. In 2025, he became a co-director of UJAW, a U.S.-based nonprofit organization, supporting Japanese Researchers in U.S.

ACADEMIC APPOINTMENTS

- Sr Res Scientist-Physical, T. H. Geballe Laboratory for Advanced Materials
- Staff Scientist, Stanford Institute for Materials and Energy Sciences

ADMINISTRATIVE APPOINTMENTS

- Co-Founder/Co-Director, Japanese Academic Seminars at Stanford (JASS), (2022- present)
- Co-Director, United Japanese researchers Around the world (UJAW), (2025- present)
- Co-Founder, Girls Who Code in Japanese, (2022- present)

HONORS AND AWARDS

- PRB Editors' Suggestion, Physical Review B (2026/02)
- PRB Editors' Suggestion, Physical Review B (2024/09)

- PRL Editors' Suggestion, Physical Review Letters (2024/07)
- UJA Outstanding Paper Award, United Japanese researchers Around the world (2024/05)
- Phys. Rev. Mater. Editors' Suggestion, Physical Review Materials (2024/02)
- PRB Editors' Suggestion, Physical Review B (2023/10)
- Appl. Phys. Lett. Editors' Picks, Applied Physics Letters (2022/11)
- Overseas Research Fellowship, Japan Society for the Promotion of Science (2018/04)
- JPSJ Papers of Editors' Choice, Journal of Physical Society of Japan (2017/01)
- Research Fellowship DC2, Japan Society for the Promotion of Science (2016/04)
- Outstanding Graduate Student Award, Graduate School of Arts and Sciences, The University of Tokyo (2015/03)

PROFESSIONAL EDUCATION

- Postdoc, Department of Applied Physics, Stanford University (2020)
- Ph.D., Department of Basic Science, The University of Tokyo, Tokyo (2018)
- M.S., Department of Basic Science, The University of Tokyo, Tokyo (2015)
- B.S., Department of Physics, Tokyo University of Science, Tokyo (2013)

LINKS

- My homepage: https://yiguchi-condmat-eng.webnode.jp/
- My homepage(Japanese): https://yusuke-iguchi-personal-page.webnode.jp/
- JASS: https://jass.sites.stanford.edu/
- UJAW: https://www.uja-info.org/about-english

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Scanning SQUID (Superconducting QUantum Interference Device) microscopy, which can obtain the local susceptibility by measuring an absolute value of magnetic flux, is very unique and strong scanning magnetic probe. The purpose of this project is to reveal the local superconducting states of unconventional superconductors, such as chiral superconductor candidates, by using the scanning SQUID microscope. Recent projects are the following.

1. Spontaneous Magnetism in Chiral superconductors
-Linear-T superfluid density and absence of spontaneous edge currents in URu2Si2
(Phys. Rev. B (Letter) 103, L220503 (2021))
-Single-phase superfluid density in high-quality UTe2
(Phys. Rev. Lett, 130, 196003 (2023))
-Observation of Edge fields in UTe2 near zero field
(Phys. Rev. B 110, 214505 (2024))

2. Unconventional Vortices in Multiband Superconductors
-Anisotropic vortex pinning potential along the twin boundaries of FeSe
(Phys. Rev. B 100, 024514 (2019))
-Isotropic and anisotropic pinning potentials at different locations of URu2Si2

(Phys. Rev. B (Letter) 103, L220503 (2021))

-Unquantized flux in a superconducting vortex at KxBa1-xFe2As2

(Science 380, 1244-1247 (2023))

3. Competition/Coexistence of Superconductivity with other orders

-Coexistence of ferromagnetic domains in a superconductor URu2Si2

(Phys. Rev. B (Letter) 103, L220503 (2021))

-Anomalous superfluid density in Pd-intercalated ErTe3 with disordered CDWs

(Phys. Rev. Lett. 133, 036001 (2024))

Publications

PUBLICATIONS

- **Vortex motion induced losses in tantalum resonators** *PHYSICAL REVIEW B*
  Bahrami, F., Bland, M. P., Shumiya, N., Chang, R. D., Hedrick, E., McLellan, R. A., Crowley, K. D., Dutta, A., Bishop-Van Horn, L., Iguchi, Y., Anbalagan, A., Cheng, G., Yang, et al
  2026; 113 (5)
- **Strain-induced superconductivity in RuO₂(100) thin-films** *COMMUNICATIONS MATERIALS*
  Wadehra, N., Gregory, B. Z., Zhang, S., Schnitzer, N., Iguchi, Y., Li, Y., Pamuk, B., Muller, D. A., Singer, A., Shen, K. M., Schlom, D. G.
  2025; 6 (1)
- **(in Japanese) Scanning Magnetic Probe Microscopy on Superconductors** *Solid State Physics*
  Iguchi, Y.
  2025; 60 (6): 23-34
- **Magnetic edge fields in UTe2 near zero background fields** *PHYSICAL REVIEW B*
  Iguchi, Y., Man, H., Thomas, S. M., Ronning, F., Ishizuka, J., Sigrist, M., Rosa, P. F. S., Moler, K. A.
  2024; 110 (21)
- **Superconducting penetration depth through a Van Hove singularity: Sr₂RuO₄ under uniaxial stress** *PHYSICAL REVIEW B*
  Mueller, E., Iguchi, Y., Jerzembeck, F., Rodriguez, J. O., Romanelli, M., Abarca-Morales, E., Markou, A., Kikugawa, N., Sokolov, D. A., Oh, G., Hicks, C. W., Mackenzie, A. P., Maeno, et al
  2024; 110 (10)
- **Anomalous Superfluid Density in a Disordered Charge-Density-Wave Material: Pd-Intercalated ErTe_{3}.** *Physical review letters*
  Iguchi, Y., Straquadine, J. A., Murthy, C., Kivelson, S. A., Singh, A. G., Fisher, I. R., Moler, K. A.
  2024; 133 (3): 036001
- **In Situ Local Imaging of Ferromagnetism and Superconductivity in RbEuFe4As4.** *Nano letters*
  Man, H., Iguchi, Y., Bao, J., Chung, D. Y., Kanatzidis, M. G.
  2024
- **Scanning SQUID study of ferromagnetism and superconductivity in infinite-layer nickelates** *PHYSICAL REVIEW MATERIALS*
  Shi, R. A., Wang, B., Iguchi, Y., Osada, M., Lee, K., Goodge, B. H., Kourkoutis, L. F., Hwang, H. Y., Moler, K. A.
  2024; 8 (2)
- **Constraints on a split superconducting transition under uniaxial strain in Sr₂RuO₄ from scanning SQUID microscopy** *PHYSICAL REVIEW B*
  Mueller, E., Iguchi, Y., Watson, C., Hicks, C. W., Maeno, Y., Moler, K. A.
  2023; 108 (14)
- **Superconducting vortices carrying a temperature-dependent fraction of the flux quantum.** *Science (New York, N.Y.)*
  Iguchi, Y., Shi, R. A., Kihou, K., Lee, C., Barkman, M., Benfenati, A. L., Grinenko, V., Babaev, E., Moler, K. A.

2023: eabp9979

- **Microscopic Imaging Homogeneous and Single Phase Superfluid Density in UTe_{2}.** *Physical review letters*
  Iguchi, Y., Man, H., Thomas, S. M., Ronning, F., Rosa, P. F., Moler, K. A.
  2023; 130 (19): 196003
- **Nonreciprocal microwave response at room temperature in multiferroic Y-type hexaferrite BaSrCo2Fe11AlO22** *APPLIED PHYSICS LETTERS*
  Hirose, S., Iguchi, Y., Nii, Y., Kimura, T., Onose, Y.
  2022; 121 (22)
- **Local observation of linear-T superfluid density and anomalous vortex dynamics in URu2Si2** *PHYSICAL REVIEW B*
  Iguchi, Y., Zhang, I. P., Bauer, E. D., Ronning, F., Kirtley, J. R., Moler, K. A.
  2021; 103 (22)
- **Imaging anisotropic vortex dynamics in FeSe** *PHYSICAL REVIEW B*
  Zhang, I. P., Palmstrom, J. C., Noad, H., Bishop-Van Horn, L., Iguchi, Y., Cui, Z., Mueller, E., Kirtley, J. R., Fisher, I. R., Moler, K. A.
  2019; 100 (2)
- **Microwave nonreciprocity of magnon excitations in the noncentrosymmetric antiferromagnet Ba2MnGe2O7** *PHYSICAL REVIEW B*
  Iguchi, Y., Nii, Y., Kawano, M., Murakawa, H., Hanasaki, N., Onose, Y.
  2018; 98 (6)
- **Magnetoelectrical control of nonreciprocal microwave response in a multiferroic helimagnet** *NATURE COMMUNICATIONS*
  Iguchi, Y., Nii, Y., Onose, Y.
  2017; 8: 15252
- **Microwave Magnetochiral Effect in the Non-centrosymmetric Magnet CuB2O4** *JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN*
  Nii, Y., Sasaki, R., Iguchi, Y., Onose, Y.
  2017; 86 (2)
- **Nonreciprocal propagation of surface acoustic wave in Ni/LiNbO3** *PHYSICAL REVIEW B*
  Sasaki, R., Nii, Y., Iguchi, Y., Onose, Y.
  2017; 95 (2)
- **Terahertz Radiation by Subpicosecond Magnetization Modulation in the Ferrimagnet LiFe5O8** *ACS PHOTONICS*
  Kinoshita, Y., Kida, N., Sotome, M., Miyamoto, T., Iguchi, Y., Onose, Y., Okamoto, H.
  2016; 3 (7): 1170–75
- **Nonreciprocal magnon propagation in a noncentrosymmetric ferromagnet LiFe5O8** *PHYSICAL REVIEW B*
  Iguchi, Y., Uemura, S., Ueno, K., Onose, Y.
  2015; 92 (18)
- **Uniaxial-Pressure Effects on Spin-Driven Lattice Distortions in Geometrically Frustrated Magnets CuFe1-xGaxO2 (x=0, 0.035)** *JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN*
  Nakajima, T., Iguchi, Y., Tamatsukuri, H., Mitsuda, S., Yamasaki, Y., Nakao, H., Terada, N.
  2013; 82 (11)

PRESENTATIONS

- Superconducting vortices carrying a temperature-dependent fraction of the flux quantum - American Physical Society March Meeting 2024 (March 4, 2024 - March 8, 2024)
- Magnetic Imaging of Chiral and Magnetic Superconductors - Materials Research Society(MRS) Spring Meeting 2025 (April 7, 2025 - April 11, 2025)
- Un-Quantized Vortex and Edge Fields in Multicomponent Superconductors - Role of Topology, Dimensionality and Correlations in Unconventional Superconductivity, Gordon Research Conference (May 4, 2025 - 5/9/2025)
- Un-quantized Vortex and Edge Fields in Multicomponent Superconductors - The International Conference on Superconductivity and Magnetism (ICSM) 2025 (April 26, 2025 - May 3, 2025)
- Magnetic Imaging Chiral Superconductors and Un-quantized Vortex - Beyond standard superconducting and superfluid states: electron quadrupling condensates and composite orders, Nordita (May 19, 2025 - May 23, 2025)

- Magnetic Imaging of Chiral and Magnetic Superconductors - 70th Magnetism and Magnetic Materials Conference (MMM2025) (October 31, 2025)