

Takahiro C. Fujita

Curriculum Vitae

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Ex nihilo nihil fit. Qui bene vivit, bene docet.

Education

- March 2017 **Ph.D. of Applied Physics & Engineering**, the University of Tokyo, Japan.
March 2014 **Master of Applied Physics & Engineering**, the University of Tokyo, Japan.
March 2012 **Bachelor of Applied Physics & Engineering**, the University of Tokyo, Japan.

Research Experiences

- Nov. 2018 – **Assistant Professor**, *the University of Tokyo*, Japan.
Present
 - Exploration of emergent phenomena at novel conducting oxides thin films/heterostructures.
 - Material design for ferromagnetic materials without magnetic elements.

April 2017 – **Postdoctoral Researcher**, *Max Planck Institute of Microstructure Physics*, Germany.
Oct. 2018
 - Emergent phenomena at heterointerfaces between oxides and topological materials.
 - Design and installation of STEM & PLD combined chamber.

Technical Strengths

- Sample Fabrication **Thin Film Growth.**
 - Pulsed laser deposition, Molecular beam epitaxy, Sputtering
 - Design and installation of growth chamber.**Structural Analysis.**
 - X-ray diffraction, Reflection high energy electron diffraction
 - Atomic force microscopy, X-ray photoemission spectroscopy**Device Fabrication.**
 - Photolithography, Electron-beam lithography
 - Ion milling, Electron-beam evaporation, Atomic layer deposition

Measurements **Electrical Measurements.**
 - Magnetotransport measurements
 - Low temperature measurements**Magnetization Measurements.**

Programing **LabVIEW, VBA, Python, Igor.**

Fundings

- April 2024 **JSPS Grants-in-Aid for Scientific Research (B) (No. JP24K01340).**
April 2024 **Toyota Physical and Chemical Research Institute.**
April 2024 **Proterial Materials Science Foundation.**
April 2023 **Yazaki Memorial Foundation for Science and Technology.**

April 2023 **Tokuyama Science Foundation.**
Dec. 2022 **The Kazuchika Okura Memorial Foundation.**
April 2021 **Iketani Science and Technology Foundation.**
April 2021 **Mizuho Science and Technology Foundation.**
Sept. 2020 **The Murata Science Foundation.**
April 2020 **JSPS Grant-in-Aid for Early-Career Scientists (No. JP20K15168).**
Sept. 2019 **Izumi Science and Technology Foundation.**

Awards and Fellowships

Jan. 2018 **Editors' Suggestion (Physical Review Materials).**
April 2017 **JSPS Overseas Research Fellowships.**
Feb. 2016 **Editors' Suggestion (Physical Review B).**
March 2015 **Young Scientist Presentation Award (Japan Society of Applied Physics).**
April 2014 **JSPS Research Fellowships for Young Scientists (No. 26-10112).**
April 2013 **Advanced Leading Graduate Course for Photon Science (ALPS).**

Publications (18 articles)

- (2024) R. Oshima, T. Hatanaka, S. Nishihaya, T. Nomoto, M. Kriener, T. C. Fujita, M. Kawasaki, R. Arita, and M. Uchida, "Ferromagnetic state with large magnetic moments realized in epitaxially strained $\text{Sr}_3\text{Ru}_2\text{O}_7$ films", [Physical Review B **109**, L121113 \(2024\)](#).
- L. Zhang, T. C. Fujita, Y. Masutake, M. Kawamura, T. Arima, H. Kumigashira, M. Tokunaga, and M. Kawasaki, "Peculiar magnetotransport properties in epitaxially stabilized orthorhombic Ru^{3+} perovskite LaRuO_3 and NdRuO_3 ", [Communications Materials **5**, 35 \(2024\)](#).
- M. Ohno, T. C. Fujita, and M. Kawasaki, "Proximity effect of emergent field from spin ice in an oxide heterostructure", [Science Advances **10**, eadk6308 \(2024\)](#).
- (2023) M. Ohno, T. C. Fujita, and M. Kawasaki, "Impact of iso-structural template layer on stabilizing pyrochlore $\text{Bi}_2\text{Rh}_2\text{O}_7$ ", [Applied Physics Letters **122**, 251601 \(2023\)](#).
- M. Ohno, T. C. Fujita, Y. Masutake, H. Kumigashira, and M. Kawasaki, "Novel supercell compounds of layered Bi–Rh–O with p -type metallic conduction materialized as a thin film form", [APL Materials **11**, 051107 \(2023\)](#).
- (2022) R. Nishino, T. C. Fujita, and M. Kawasaki, "Electric field control of anomalous Hall effect in $\text{CaIrO}_3/\text{CaMnO}_3$ heterostructure", [APL Materials **10**, 081104 \(2022\)](#).
- T. C. Fujita, H. Ito, and M. Kawasaki, "Trends in bandgap of epitaxial $A_2B_2O_7$ ($A = \text{Sn, Pb}$; $B = \text{Nb, Ta}$) films fabricated by pulsed laser deposition", [APL Materials **10**, 051112 \(2022\)](#).
- (2021) H. Ito, T. C. Fujita, and M. Kawasaki, "Single crystalline $\text{Sn}_2\text{Nb}_2\text{O}_7$ films with Ti-doping fabricated by pulsed laser deposition", [APL Materials **9**, 101116 \(2021\)](#).
- L.-F. Zhang, T. C. Fujita, and M. Kawasaki, "Evolution of ferromagnetism captured by magnetotransport in compressively strained $\text{Sr}_{1-x}\text{Pb}_x\text{RuO}_3$ thin films", [Physical Review Materials **5**, 044402 \(2021\)](#).

- (2020) R. Nishino, T. C. Fujita, F. Kagawa, and M. Kawasaki, “Evolution of ferroelectricity in ultrathin PbTiO_3 films as revealed by electric double layer gating”, [Scientific Reports 10, 10864 \(2020\)](#).
- T. C. Fujita, L. F. Zhang, and M. Kawasaki, “Antiferromagnetic metallic state as proved by magnetotransport in epitaxially stabilized perovskite PbRuO_3 ”, [Physical Review Materials 4, 031401 \(2020\)](#).
- (2018) T. C. Fujita, Y. Kozuka, J. Matsuno, M. Uchida, A. Tsukazaki, T. Arima, and M. Kawasaki, “All-in-all-out magnetic domain inversion in $\text{Tb}_2\text{Ir}_2\text{O}_7$ with molecular fields antiparallel to external fields”, [Physical Review Materials 2, 011402 \(2018\)](#).
- (2017) Y. Kozuka, T. C. Fujita, M. Uchida, T. Nojima, A. Tsukazaki, J. Matsuno, T. Arima, and M. Kawasaki, “Visualizing ferroic domains in an all-in-all-out antiferromagnet thin film”, [Physical Review B 96, 224417 \(2017\)](#).
- (2016) T. C. Fujita, M. Uchida, Y. Kozuka, W. Sano, A. Tsukazaki, T. Arima, and M. Kawasaki, “All-in-all-out magnetic domain wall conduction in a pyrochlore iridate heterointerface”, [Physical Review B 93, 064419 \(2016\)](#).
- T. C. Fujita, M. Uchida, Y. Kozuka, S. Ogawa, A. Tsukazaki, T. Arima, and M. Kawasaki, “All-in-all-out magnetic domain size in pyrochlore iridate thin films as probed by local magnetotransport”, [Applied Physics Letters 108, 022402 \(2016\)](#).
- (2015) T. C. Fujita, Y. Kozuka, M. Uchida, A. Tsukazaki, T. Arima, and M. Kawasaki, “Odd-parity magnetoresistance in pyrochlore iridate thin films with broken time-reversal symmetry”, [Scientific Reports 5, 9711 \(2015\)](#).
- (2013) T. C. Fujita, Y. Kozuka, H. Seki, and M. Kawasaki, “Charge-spin-coupled electrical transport properties in $\text{EuMoO}_3/\text{SrTiO}_3$ superlattices”, [Physical Review B 87, 205402 \(2013\)](#).
- (2012) Y. Kozuka, H. Seki, T. C. Fujita, S. Chakraverty, K. Yoshimatsu, H. Kumigashira, M. Oshima, M. S. Bahramy, R. Arita, and M. Kawasaki, “Epitaxially stabilized EuMoO_3 : A new itinerant ferromagnet”, [Chemistry of Materials 24, 3746–3750 \(2012\)](#).

International Conferences

- (2024) T. C. Fujita, “Proximity effect of emergent field from spin ice in epitaxial pyrochlore heterostructures”, APS March Meeting 2024 **Oral (invited)**, Minneapolis, U.S.A., March 3–8 (2024).
- M. Ohno, T. C. Fujita, and M. Kawasaki, “Proximity effect of spin ice in pyrochlore oxide heterostructures”, CEMS Symposium on Emergent Quantum Materials 2024 **Poster**, Tokyo, Japan, February 20–22 (2024).
- T. C. Fujita, M. Ohno, and M. Kawasaki, “Epitaxially stabilized pyrochlore $\text{Bi}_2\text{Rh}_2\text{O}_7$ phase by using iso-structural $\text{Eu}_2\text{Ti}_2\text{O}_7$ template layer”, CEMS Symposium on Emergent Quantum Materials 2024 **Poster**, Tokyo, Japan, February 20–22 (2024).
- (2023) T. C. Fujita, M. Ohno, and M. Kawasaki, “Proximity effect of spin ice”, 29th International Workshop on Oxide Electronics (iWOE29) **Oral**, Busan, Korea, October 15–18 (2023).

- M. Ohno, T. C. Fujita, and M. Kawasaki, “Epitaxially stabilized pyrochlore $\text{Bi}_2\text{Rh}_2\text{O}_7$ thin films by using iso-structural template layer”, 29th International Workshop on Oxide Electronics (iWOE29) **Poster**, Busan, Korea, October 15–18 (2023).
- M. Ohno, T. C. Fujita, Y. Masutake, H. Kumigashira, and M. Kawasaki, “Metallic Bi-Rh-O thin films with p-type conduction”, APS March Meeting 2023 **Oral**, Las Vegas, U.S.A., March 5–10 (2023).
- (2022) T. C. Fujita, H. Ito, and M. Kawasaki, “Trend in Optical Bandgap of $A_2B_2O_7$ ($A = \text{Sn, Pb}$; $B = \text{Nb, Ta}$) Thin Films”, 28th International Workshop on Oxide Electronics (iWOE28) **Oral**, Portland, U.S.A., October 2–5 (2022).
- L. Zhang, T. C. Fujita, and M. Kawasaki, “Unconventional anomalous Hall effect in Ru(III) perovskite oxide thin films”, 28th International Workshop on Oxide Electronics (iWOE28) **Poster**, Portland, U.S.A., October 2–5 (2022).
- T. C. Fujita, R. Nishino, and M. Kawasaki, “Electrical gate tuning of anomalous Hall effect in $\text{CaIrO}_3/\text{CaMnO}_3$ heterointerface”, The 29th International Conference on Low Temperature Physics (LT29) **Poster**, Sapporo, Japan, August 18–24 (2022).
- L. Zhang, T. C. Fujita, and M. Kawasaki, “Fabrication and magnetotransport properties of LnRuO_3 ($\text{Ln} = \text{La, Nd}$) single crystalline thin films”, The 29th International Conference on Low Temperature Physics (LT29) **Poster**, Sapporo, Japan, August 18–24 (2022).
- (2021) L. Zhang, T. C. Fujita, and M. Kawasaki, “Ferromagnetism and magnetotransport properties of Pb doped SrRuO_3 thin films”, 27th International Workshop on Oxide Electronics (iWOE27) **Poster**, Genoa, Italy, October 13–15 (2021).
- T. C. Fujita, H. Ito, and M. Kawasaki, “Pulsed laser deposition and optical properties of $\text{Sn}_2\text{Nb}_2\text{O}_7$ as a possible candidate of flat-band oxide”, 27th International Workshop on Oxide Electronics (iWOE27) **Poster**, Genoa, Italy, October 13–15 (2021).
- (2019) R. Nishino, T. C. Fujita, F. Kagawa, and M. Kawasaki, “Evolution of polarization in ultrathin PbTiO_3 films as revealed by electric double layer gating”, 26th International Workshop on Oxide Electronics (iWOE26) **Poster**, Kyoto, Japan, September 29–October 2 (2019).
- R. Nishino, T. C. Fujita, F. Kagawa, and M. Kawasaki, “Thickness-dependent ferroelectric properties in PbTiO_3 films measured by electric double layer structure”, CEMS Symposium on Emergent Quantum Materials **Poster**, Tokyo, Japan, May 22–24 (2019).
- (2018) T. C. Fujita, Y. Zhang, and S. S. P. Parkin, “Attempt to enhance T_C of FeSe with antiferromagnetic proximity effect in $\text{FeSe}/\text{LaFeO}_3/\text{SrTiO}_3$ ”, International Workshop, Collaborative Research Centre SFB 762: Functionality of Oxide Interfaces **Poster**, Munich, Germany, February 26–March 2 (2018).
- (2017) T. C. Fujita, “Anisotropy-tuned magnetotransport in pyrochlore iridates”, Twente Halle Workshop **Oral (invited)**, Halle (Saale), Germany, May 5 (2017).
- (2016) Y. Kozuka, T. C. Fujita, M. Uchida, T. Nojima, A. Tsukazaki, J. Matsuno, T. Arima, and M. Kawasaki, “Visualizing ferroic domains of all-in-all-out antiferromagnet in a pyrochlore iridate thin film”, 2016 MRS Fall Meeting & Exhibition **Oral**, Boston, U.S.A., November 27–December 2 (2016).

- T. C. Fujita, M. Uchida, Y. Kozuka, W. Sano, A. Tsukazaki, T. Arima, and M. Kawasaki, “Metallic domain wall at all-in-all-out pyrochlore iridate heterointerface”, 23rd International Workshop on Oxide Electronics (iWOE23) **Oral**, Nanjing, China, October 12–14 (2016).
- (2015) T. C. Fujita, M. Uchida, W. Sano, S. Ogawa, Y. Kozuka, A. Tsukazaki, T. Arima, and M. Kawasaki, “All-In-All-Out Magnetic Domain Transport in Pyrochlore Iridate Films and Heterostructures”, CEMS Topical Meeting on Oxide Interfaces 2015 **Poster**, Saitama, Japan, November 5–6 (2015).
- T. C. Fujita, M. Uchida, Y. Kozuka, S. Ogawa, A. Tsukazaki, T. Arima, and M. Kawasaki, “All-in-all-out magnetic domain size in pyrochlore iridate thin films revealed by local transport measurements”, 22nd International Workshop on Oxide Electronics (iWOE22) **Poster**, Paris, France, October 7–9 (2015).
- T. C. Fujita, Y. Kozuka, M. Uchida, A. Tsukazaki, T. Arima, and M. Kawasaki, “Odd-parity magnetoresistance in pyrochlore iridate thin films with broken time-reversal symmetry”, APS March Meeting 2015 **Oral**, Texas, U.S.A., March 2–6 (2015).
- (2014) T. C. Fujita, Y. Kozuka, M. Uchida, A. Tsukazaki, T. Arima, and M. Kawasaki, “Detecting the Magnetic Domains of All-In-All-Out Spin Structure via Magnetotransport in Pyrochlore Iridate Thin Films”, 21st International Workshop on Oxide Electronics (iWOE21) **Oral**, New York, U.S.A., September 28–October 1 (2014).
- (2013) T. C. Fujita, Y. Kozuka, A. Tsukazaki, T. Arima, and M. Kawasaki, “Octupole Magnetic Ordering and Magnetotransport Properties in $\text{Eu}_2\text{Ir}_2\text{O}_7$ Thin Films”, FIRST-Qs2C Workshop on “Emergent phenomena of correlate materials” **Poster**, Tokyo, Japan, November 13–16 (2013).
- T. C. Fujita, Y. Kozuka, H. Seki, S. Chakraverty, K. Yoshimatsu, H. Kumigashira, M. Oshima, M. S. Bahramy, R. Arita, and M. Kawasaki, “Epitaxially Stabilized Perovskite EuMoO_3 : A New Itinerant Ferromagnet”, 2013 MRS Spring Meeting & Exhibition **Oral**, California, U.S.A., April 1–5 (2013).

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