Koichiro Takahashi

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Publications:

"Symmetry and minimal Hamiltonian of nonsymmorphic collinear antiferromagnet MnTe"
Authors: **Koichiro Takahashi**, Hong-Fei Huang, Jie-Xiang Yu, and Jiadong Zang
Citation: Takahashi, K., Huang, HF., Yu, JX. *et al*. *npj Quantum Mater.* **10**, 70 (2025).
Link: https://doi.org/10.1038/s41535-025-00784-1

- Analytical calculation of electronic band structure of MnTe by tight-binding modeling
- Symmetry analysis on effective Hamiltonian by magnetic space group of MnTe

"GPTArticleExtractor: An automated workflow for magnetic material database construction"
Authors: Yibo Zhang, Suman Itani, Kamal Khanal, Emmanuel Okyere, Gavin Smith, **Koichiro Takahashi**, Jiadong Zang
Citation: Journal of Magnetism and Magnetic Materials, 2024, Volume 597, Page 172001
Link: https://doi.org/10.1016/j.jmmm.2024.172001

- Created a magnetic materials database, which contains 2,035 entries with full chemical, structural and magnetic transition temperature information. My role was the data curation of the extracted material information.

ArXiv preprints:

"Inertia in skyrmions confined to one-dimensional geometries"
Authors: **Koichiro Takahashi**, Sergey S. Pershoguba, and Jiadong Zang
Citation: arXiv:2409.17461 (2024)
Link: https://doi.org/10.48550/arXiv.2409.17461
Supervisors: Sergey Pershoguba, Jiadong Zang

- Theoretical study of current-driven dynamics of skyrmion confined in 1D helical backgrounds

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Poster presentations:

- **Northeast Quantum Forum (NEQT) 2024 (**University of New Hampshire)

Poster title: Tight-binding modeling of altermagnet candidate MnTe
Poster link: https://koichiro0110.github.io/Figures/Poster_MnTe.pdf
Conference website link: https://sites.usnh.edu/neqt/

- **UNH Undergraduate Research Conference (URC)** (University of New Hampshire)

Poster title: Nonlinear dynamics of skyrmion in helical lanes
Poster link: https://koichiro0110.github.io/Figures/Poster_skyrmion.pdf

- **2024 US Quantum Information Science Summer School** (Oak Ridge National Laboratory)

Poster title: Nonlinear dynamics of skyrmion in helical lanes

・Presented the preliminary results on the skyrmion project at ORNL

Research and Experience:

Research Collaboration in the Condensed Matter Theory Group at Saitama University
Period: 01/2025-Present; Supervisor: Shintaro Hoshino

Research Assistant in the Theoretical Condensed Matter Physics Group
Period: 05/2023-Present; Institution: University of New Hampshire
Supervisor: **Jiadong Zang**, Sergey Pershoguba

2024 US Quantum Information Science Summer School (USQIS)
Date: July 14-26, 2024; Institution: Oak Ridge National Laboratory (ORNL)
・Advanced topics related to quantum computing, topological superconductors, Kitaev spin liquid, DMRG, etc.
・Interacted with competitive graduate students and postdocs by discussions and studies
・Website: https://www.qscience.org/us-quantum-information-science-summer-school/

Education:

Bachelor of Science in Physics at University of New Hampshire
Period: 08/2023-12/2024; GPA: 4.0/4.0

2-semester Study Exchange in Physics at University of New Hampshire
Period: 08/2022-05/2023; Place: Durham, New Hampshire, USA; GPA: 4.0/4.0

Undergraduate Student in Physics at Saitama University (Transferred to UNH)
Period: 04/2021-08/2022; Place: Sakura-Ku, Urawa, Saitama, Japan; Class of 2025
Earned Credits: 73; GPA: 3.71/4.0 (*Top* of my cohort)

Scholarships and Awards:

・**UNH Summer Undergraduate Research Fellowships (SURF)**
・**UNH Physics Karsten Pohl Scholarship 2024-2025**
・**UNH Transfer Excellence Scholarship**
・**Gyomu Super Japan Dream Foundation Scholarship 2022**
・**Dean's list in Highest Honors at University of New Hampshire**
・**Outstanding Grade Award from the Physics Department of Saitama University**

Teaching Experience:

Teaching Assistant in Thermodynamics and Statistical Mechanics (Undergraduate)
・Teach recitations, 50 mins per week, plus grading homework and quizzes

Extracurricular Activities and Leadership Experience:

UNH Men's Volleyball Club

・Played in tournaments held at Boston College, UMass Lowell, UNH etc.

Office of the International Students and Scholars (OISS) Orientation Leader

・Worked as one of the orientation leaders for new international students at UNH in 2024 Fall