

Koichiro Takahashi

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Projects and Publications:

“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

Unpublished:

“Symmetry and tight-binding modeling of altermagnet candidate MnTe”

Authors: **Koichiro Takahashi**, Jie-Xiang Yu, and Jiadong Zang

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

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