Yan Zha, M.Sc.

yan.zha@elms.hokudai.ac.jp Homepage Yan S. Zha
ORCID arXiv Google Scholar ResearchGate
Sapporo, Hokkaido, Japan Hokkaido University

Education

2026.04 – present — Ph.D. student in Condensed Matter Physics, Graduate School of Science, **Hokkaido University**. Expected graduation: 2029.03.

2024.04 – 2026.03 — **M.Sc.** in Condensed Matter Physics, Graduate School of Science, **Hokkaido University**.

2020.04 – 2024.03 — **B.Sc.** in Material Science, School of Science, **Yokohama City University**.

Employment History

2025.02 – 2025.03 — **Research Assistant (RA), Hokkaido University**, Sapporo, Japan.
Supervisor: Prof. Dr. Satoru Hayami
Responsibilities: Conduct self-consistent mean-field calculations of skyrmion lattices and assemble and maintain high-spec workstations for scientific computation.

Research Publications

Journal Articles

1. **Y.Z.** and S. Hayami, "Effects of crystal field and momentum-based frustrated exchange interactions on multiorbital square skyrmion lattice," *Phys. Rev. B*, vol. 113, p. 174 415, 17 May 2026. DOI: 10.1103/4sqm-xhw9.
2. **Y.Z.** and S. Hayami, "Square skyrmion lattice in multiorbital f-electron systems," *Phys. Rev. B*, vol. 111, p. 165 155, 16 Apr. 2025. DOI: 10.1103/PhysRevB.111.165155.

Presentations

Invited Talks

2026.04.23 — **ICSM/ICQMT 2026**, *Formation Mechanisms of Square Skyrmion Lattices in Multi-Orbital Electron Systems*, **Y.Z.** and S. Hayami, Abstract ID No : 30383, Assigned Session: "Nonuniform Magnetic Textures: Vortices, Skyrmions and Hopfions", Liberty Lykia Hotel, Ölüdeniz-Fethiye, Türkiye.

Oral Presentations

2025.09.16 — **The Physical Society of Japan 2025 Annual Meeting**, *Effects of Crystal Field and Momentum-Based Frustrated Interaction on Multiorbital Square Skyrmion Lattice*, **Y.Z.** and S. Hayami, 19aSK314-7 at 19aSK314, Hiroshima University, Higashihiroshima, Hiroshima, Japan.

2025.03.18 — **The Physical Society of Japan 2025 Spring Meeting Online Virtual Meeting**, *Mean-field Analysis of a Square Skyrmion Lattice in Multi-Orbital f-Electron Systems*, **Y.Z.** and S. Hayami, Online.

Presentations (continued)

Poster Presentations

2026.03.03 **2nd Japan-Germany Workshop Correlated and Topological Quantum Materials**, *Formation Mechanisms of Square Skyrmion Lattices in Centrosymmetric Multi-Orbital Electron Systems*, **Y.Z.** and S. Hayami, P45, *Mean-field Analysis of Square Skyrmion Lattice in Noncentrosymmetric 4f-Electron Single-Orbital Systems*, C. Guan, **Y.Z.** and S. Hayami, P4, Akira Suzuki Hall, Hokkaido University, Japan.

2026.01.07 **Annual workshop in FY2025, Grant-in-Aid for Transformative Research Areas (A) "Asymmetric Quantum Matters"**, *Effects of crystal field and momentum-based frustrated exchange interactions on multiorbital square skyrmion lattice*, **Y.Z.** and S. Hayami, Nagoya Institute of Technology, Nagoya, Aichi, Japan.

2025.02.16 **Workshop on theory of cross correlations, multipoles, and computational material design**, *Mean-field analysis of a square skyrmion lattice in multi-orbital f-electron systems*, **Y.Z.** and S. Hayami, Gotemba Tokinosumika, Gotemba, Shizuoka, Japan.

Pedagogical Materials

2024.10.17 *From Classical Heisenberg Model to Spiral Magnetism*, which guides readers through using the frustrated classical Heisenberg model to determine the conditions under which spiral magnetic configuration emerges. Available in both the Chinese version and the Japanese version. An English version is not yet available.

One-Dimensional Ising Model: Phase Transition, Symmetry Breaking, and the Critical Exponent of Heat Capacity at Constant Volume, Available only in the Chinese version.

Skills

Coding Skills — Mathematica, Python and LaTeX.

Languages — Chinese: Native proficiency.
Japanese: Full professional proficiency (JLPT N1, 152/180; credential ID: N1A180545J).
English: Professional Working Proficiency (TOEIC Listening and Reading, total score 845).

Sports and Hobbies — Yokohama City University Table Tennis Club, 2021.9 – 2024.3.
Yokohama City University Medical Table Tennis Club, 2022.8 – 2024.3.
Photography.

Miscellaneous Experience

Awards

Distinguished Student Award, Graduate School of Science, Hokkaido University (2026).

Fellowships

2026.04 – 2029.03 **April 2026 Hokkaido University EXEX Doctoral Fellowship (JST SPRING program)**, Japan Science and Technology Agency (JST).

Scholarships and Tuition Fee Waivers

2025.04 – 2025.09 **HU Tuition Fee Waiver (1/4 of the full amount)**, Hokkaido University.

2024.10 – 2025.03 **HU Tuition Fee Waiver (full amount, maximum)**, Hokkaido University.

Miscellaneous Experience (continued)

2023.04 – 2024.03 **YCU tuition fee reduction (1/2 of the amount, maximum)**, Yokohama City University.

2022.04 – 2023.04 **YCU tuition fee reduction (1/2 of the amount, maximum)**, Yokohama City University.

2021.04 – 2022.03 **YCU tuition fee reduction (1/2 of the amount, maximum)**, Yokohama City University.

2021.04 – 2023.03 **JEES Scholarships**, 40000 yen/month for 2 years, Japan Educational Exchanges and Services (JEES).

2020.04 – 2021.03 **YCU tuition fee reduction (full amount, maximum)**, Yokohama City University.