Curriculum Vitae

Ryota Ono

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Work History

Research Assistant

(2018–2019): Graduate School of Science and Engineering, Chiba University

Research Internships

(Jun. 2018): "Nanosystem Initiative München (NIM) Summer Research," Ludwig-Maximilians-Universität München (LMU)

(Jun. 2019, Nov. 2019, Mar. 2021): National Institute for Materials Science (NIMS)

(Aug. 2019): Tokyo Institute of Technology

Postdoctoral Fellow

(Jun. 2021–Mar. 2023): Istituto Italiano di Tecnologia (IIT)

(Apr. 2023–Mar. 2025): National Institute for Materials Science (NIMS), JSPS Research Fellow

(Apr. 2025–present): Japan Atomic Energy Agency (JAEA), Postdoctoral Fellow

Mentoring History

Master's Students

(Apr. 2021–Mar. 2023): Kodai Takahashi (Chiba University, Japan)

(Apr. 2024–Mar. 2026): Eiki Yamaguchi (Chiba University, Japan)

Education

Mar. 2013	High school diploma
Apr. 2013–Mar. 2015	National Institute of Technology, Sendai College
Mar. 2017	B.Sc., Faculty of Engineering, Department of Nanoscience, Chiba University
Sep. 2018	M.Sc., Graduate School of Science and Engineering, Department of Materials Science, Chiba University
Mar. 2021	Ph.D., Graduate School of Science and Engineering, Department of Materials Science, Chiba University

External Funding

Apr. 2023–Mar. 2025: Japan Society for the Promotion of Science (JSPS), Grants-in-Aid for Scientific Research (KAKENHI), JPY 2,730,000.

Awards

NFAM2024 Poster Award, "Orbital-Ordered p-Orbital-Origin Multiferroics in CsO_2," New Frontiers in Advanced Magnetism 2024, Hokkaido, 9 August 2024.

Press Releases and Research Highlights

1. Igor Solovyev, **Ryota Ono**, and Sergey Nikolaev, "Ferromagnetic Ferroelectricity from Orbital Ordering," Physics Magazine (2024).
2. Noriki Terada, Dmitry D. Khalyavin, Pascal Manuel, Fabio Orlandi, Christopher Ridley, Craig Bull, **Ryota Ono**, Igor Solovyev, Takashi Naka, Dharmalingam Prabhakaran, and Andrew T. Boothroyd, "Cupric Oxide Exhibiting Both Magnetic and Dielectric Properties at Room Temperature," NIMS press release (2022).
3. Igor Solovyev, **Ryota Ono**, and Sergey Nikolaev, "Revising a Generalized Spin-Current Theory for the Magnetoelectric Effect in Multiferroics," Tokyo Institute of Technology news release (2021).

Publications

1. Masaki Imai, Yasufumi Araki, **Ryota Ono**, Takashi U. Ito, Hironari Isshiki, Takashi Kikugawa, Takumi Funato, Yoshinori Haga, Hiroki Arisawa, Eiji Saitoh, Jun'ichi Ieda, and Hiroyuki Chudo, "Upper Limit of Temperature-Gradient-Induced Internal Magnetic Field in Tellurium Revealed by Muon Spin Rotation," *J. Phys. Soc. Jpn.* (in press). [IF 2.8]
2. Igor Solovyev, **Ryota Ono**, and Sergey Nikolaev, "Ferromagnetic Ferroelectricity due to the Kugel–Khomskii Mechanism of the Orbital Ordering Assisted by Atomic Hund's Second-Rule Effects," *Phys. Rev. B* **110**, 205116 (2024). (Editor's Suggestion; selected for coverage in *Physics Magazine*.) [IF 3.7]
3. **Ryota Ono**, Igor Solovyev, and Sergey Artyukhin, "Multiferroic Kinks and Spin-Flop Transition in Ni_2InSbO_6 from First Principles," *npj Spintronics* **2**, 17 (2024).
4. Noriki Terada, Dmitry D. Khalyavin, Pascal Manuel, Fabio Orlandi, Christopher Ridley, Craig Bull, **Ryota Ono**, Igor Solovyev, Takashi Naka, Dharmalingam Prabhakaran, and Andrew T. Boothroyd, "Room-Temperature Type-II Multiferroic Phase Induced by Pressure in Cupric Oxide," *Phys. Rev. Lett.* **129**, 217601 (2022). [IF 8.6]
5. Igor Solovyev, **Ryota Ono**, and Sergey Nikolaev, "Magnetically Induced Polarization in Centrosymmetric Bonds," *Phys. Rev. Lett.* **123**, 187601 (2021). [IF 8.6]
6. **Ryota Ono**, Alberto Marmodoro, Yoshitaka Nakata, Jan Minár, Hubert Ebert, Jürgen Braun, Kazuyuki Sakamoto, and Peter Krüger, "Surface Band Characters of Weyl Semimetal Candidate $MoTe_2$ Revealed by One-Step ARPES Theory," *Phys. Rev. B* **103**, 125139 (2021). [IF 3.7]
7. **Ryota Ono**, Sergey Nikolaev, and Igor Solovyev, "Fingerprints of Spin-Current Physics on Magnetoelectric Response in the Spin-1/2 Magnet $Ba_2CuGe_2O_7$," *Phys. Rev. B* **102**, 064422 (2020). [IF 3.7]
8. **Ryota Ono** and Peter Krüger, "A One-Dimensional Model for Photoemission Calculations from Plane-Wave Band-Structure Codes," *e-J. Surf. Sci. Nanotechnol.* **16**, 49–52 (2018). [IF 0.7]

Papers under Review / Preprints

1. Ravi Kaushik, **Ryota Ono**, and Sergey Artyukhin, "Finite-Temperature Magnetic Interactions from First Principles."
2. **Ryota Ono**, Ravi Kaushik, Sergey Artyukhin, Martin Jansen, Igor Solovyev, and Russell A. Ewings, "Entangled Orbital, Spin, and Ferroelectric Orders in the p-Electron Magnet CsO_2," arXiv:2411.06671.
3. **Ryota Ono**, Jun'ichi Ieda, Michiyasu Mori, and Sadamichi Maekawa, "A Microscopic Design Rule for Spin Supersolids in Triangular-Lattice Magnets," arXiv:2606.06111.

Invited Talks

1. ○ **Ryota Ono**, "XXZ Anisotropy in $J_{\mathrm{eff}} = 1/2$ Triangular-Lattice Antiferromagnets: A Microscopic Map from Trigonal Distortion," International Workshop on Correlated Materials and Electron Spectroscopy, Chiba University, Japan, 27 February 2026.
2. ○ **Ryota Ono**, "Generalized Katsura–Nagaosa–Balatsky Theory and Its Effect in Mott Insulators," International Symposium on X-Ray Spectroscopies of Synchrotron Radiation, Toyama University, Japan, 25 March 2024.

Conference Contributions

Oral Presentations

1. ○ **Ryota Ono**, Jun'ichi Ieda, Michiyasu Mori, and Sadamichi Maekawa, "Designing XXZ Anisotropy by Trigonal Crystal Fields in Co-Based Triangular-Lattice Antiferromagnets for Spin Supersolids," ISMMA2026, Busan, South Korea, 30 June 2026.
2. ○ **Ryota Ono**, Jun'ichi Ieda, Michiyasu Mori, and Sadamichi Maekawa, "三角格子反強磁性体物質の三方歪みによる磁気異方性の変化," Spring Meeting of the Physical Society of Japan 2026, online, Japan, 24 March 2026.
3. ○ **Ryota Ono**, "Generalized Katsura–Nagaosa–Balatsky Theory and Emergent Magnetoelectric Effects in Mott Insulators," ISSP Theory Mini-Workshop "Correlated Quantum Materials + Beyond" (CQM+b2024), Japan, 27 November 2024.
4. ○ **Ryota Ono**, "Exploration of Novel Magnetism and Magnetoelectric Effect by Ginzburg–Landau Theory," Spring Meeting of the Physical Society of Japan 2024, online, Japan, 20 March 2024.
5. ○ **Ryota Ono**, Igor Solovyev, and Sergey Artyukhin, "Incommensurate Multiferroic Phase in Corundum Ni_2SbInO_6," 78th Annual Autumn Meeting of the Physical Society of Japan, Sendai, Japan, 17

September 2023.

6. ○ **Ryota Ono**, Igor Solovyev, and Sergey Artyukhin, “Realistic Anisotropic Spin Hamiltonian in Multiferroic Ni_3TeO_6,” Psi-k Conference 2022, Lausanne, Switzerland, 25 August 2022.
7. ○ **Ryota Ono**, Igor Solovyev, and Sergey Artyukhin, “Computing Exchange Anisotropy in a Half-Filled e_g System from a Wannier Tight-Binding Model,” International Conference on Strongly Correlated Electron Systems, Amsterdam, the Netherlands, 26 July 2022.
8. ○ **Ryota Ono**, Igor Solovyev, and Sergey Nikolaev, “Magnetically Induced Ferroelectricity in a Spin-1/2 System,” 2021 Autumn Meeting of the Physical Society of Japan, online, Japan, September 2021.
9. ○ **Ryota Ono**, Sergey Nikolaev, and Igor Solovyev, “Magnetically Induced Ferroelectricity in Spin-1/2 $Ba_2CuGe_2O_7$,” DFT2Models, online, Italy, 16 June 2021.
10. ○ **Ryota Ono**, Sergey Nikolaev, and Igor Solovyev,
“Magnetoelectric Effect in Multiferroic $Ba_2CuGe_2O_7$,” 76th Annual Meeting of the Physical Society of Japan, online, Japan, March 2021.
11. ○ **Ryota Ono**, Alberto Marmodoro, Yoshitaka Nakata, Jan Minár, Hubert Ebert, Jürgen Braun, Kazuyuki Sakamoto, and Peter Krüger, “ARPES Calculations of the Weyl-Semimetal Candidate Material $MoTe_2$,” International Symposium on Spectro-Microscopy of Functional Materials and Interfaces, Chiba, Japan, 28 October 2019.
12. ○ **Ryota Ono**, Alberto Marmodoro, Yoshitaka Nakata, Jan Minár, Hubert Ebert, Jürgen Braun, Kazuyuki Sakamoto, and Peter Krüger, “First-Principles Analysis of the Surface States of the Type-II Weyl Semimetal $MoTe_2$,” 74th Annual Autumn Meeting of the Physical Society of Japan, Gifu, Japan, September 2019.

Poster Presentations

13. ○ **Ryota Ono**, Jun’ichi Ieda, Michiyasu Mori, and Sadamichi Maekawa, “Trigonal-Field Engineering of Spin Supersolids in Triangular-Lattice Cobaltates,” US–Japan Workshop, Tokai-mura, Japan, 24 June 2026.
14. ○ **Ryota Ono** and Jun’ichi Ieda, “Microscopic Theory of Magnetoelectric Coupling and Its Application to Quantum Spin-Supersolid Candidate Materials,”「相関設計で挑む量子創発」領域会議, RIKEN, Japan, 16 December 2025.
15. ○ **Ryota Ono** and Igor Solovyev, “XXZ Spin Hamiltonian and Generalized Katsura–Nagaosa–Balatsky Theory in an Orbital-Ordered p-Orbital Magnet: Alkali Superoxides,” 8th Symposium for the Core Research Clusters for Materials Science and Spintronics and 7th Symposium on International Joint Graduate Programs in Materials Science and Spintronics (CRCGP-MSSP2024), Tohoku University, Japan, 19 November 2024.
16. ○ **Ryota Ono**, “Magnetoelectric Effect in Quantum Dimer Systems due to Triplon BEC,” Joint Workshop LANL/NIMS Quantum and Functional Materials and MANA International Symposium 2024, NIMS, Japan, 16 October 2024.
17. ○ **Ryota Ono**, Russell Ewings, and Igor Solovyev, “Orbital-Ordered p-Orbital-Origin Multiferroics in CsO_2,” New Frontiers in Advanced Magnetism 2024, Hokkaido University, Japan, 7 August 2024.
18. ○ **Ryota Ono**, “Electrical Control of a Skyrmionic Lattice in Centrosymmetric Non-Frustrated Insulating Magnets,” International Symposium on Quantum Electronics 2024, the University of Tokyo, Japan, 2 February 2024.
19. ○ **Ryota Ono**, Russell Ewings, Sergey Artyukhin, and Igor Solovyev, “Orbital and Magnetic Order in Alkali Superoxide CsO_2,” MANA International Symposium 2023: Nanoarchitectonics and Quantum Materials, NIMS, Tsukuba, Japan, 9 November 2023.
20. ○ **Ryota Ono**, Igor Solovyev, and Sergey Artyukhin, “Spin-Spiral Order and Magnetic-Kink Interactions in Multiferroic Ni_2InSbO_6,” 14th APCTP Workshop on Multiferroics, the University of Tokyo, Japan, 19 October 2023.
21. ○ **Ryota Ono**, Alberto Marmodoro, Yoshitaka Nakata, Jan Minár, Hubert Ebert, Jürgen Braun, Kazuyuki Sakamoto, and Peter Krüger, “Theoretical Study of the Candidate Material for Type-II Weyl Semimetal $MoTe_2$ Using the Relativistic KKR Method,” Deutsche Physikalische Gesellschaft e.V. (DPG) Regensburg 2019, University of Regensburg, Germany, 3 April 2019.
22. ○ **Ryota Ono** and Peter Krüger, “Matching Method for ARPES-Intensity Calculations from a Plane-Wave Basis,” 73rd Annual Meeting of the Physical Society of Japan, Tokyo University of Science, Noda, Japan, March 2018.
23. ○ **Ryota Ono** and Peter Krüger, “Final-State Effects in ARPES from Plane-Wave Band-Structure Methods,” 8th International Symposium on Surface Science (ISSS-8), Tsukuba, Japan, 23 October 2017.

Seminars

24. ○ **Ryota Ono**, "From first-principles electronic structure to effective spin and magnetoelectric models in correlated insulators," Yukitoshi Motome's Group, the University of Tokyo, Japan, 18 May 2026.
25. ○ **Ryota Ono**, "First-Principles Hubbard Models Beyond DFT+U for Mott Insulators," Silvia Picozzi's Group, University of Milano-Bicocca, Milan, Italy, 9 March 2026.
26. ○ **Ryota Ono**, "First-Principles Hubbard Models Beyond DFT+U for Mott Insulators," Sergey Artyukhin's Group, Istituto Italiano di Tecnologia, Genoa, Italy, 2 March 2026.
27. ○ **Ryota Ono**, "Generalized Katsura–Nagaosa–Balatsky Theory and Its Application," Masahiro Sato's Group, Chiba University, Japan, 9 December 2025.

Skills

Condensed-matter theory: density functional theory (DFT), multiferroics, magnetism, many-body physics, and multiple-scattering theory.

Ab initio calculations: VASP, WIEN2k, Quantum ESPRESSO, and FPLO.

Development of DFT-based many-body methods using Wannier90, constrained random-phase approximation, and microscopic spin-model construction.

Derivation of effective Hamiltonians, including isotropic and anisotropic spin Hamiltonians.

Emergent spin phenomena: Landau–Lifshitz–Gilbert dynamics and Ginzburg–Landau continuum theories.

Quantum spin models: exact diagonalization and density-matrix renormalization group (DMRG).

Professional Activities

Referee: *Physical Review Letters*; *Physical Review B*; *Applied Physics A*; *International Journal of Modern Physics B*.