

So Chigusa

Curriculum Vitae

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EDUCATION

- 2020 Ph.D. in Physics, Department of Physics, University of Tokyo
- 2017 M.S. in Physics, Department of Physics, University of Tokyo
- 2015 B.S. in Physics, Department of Physics, University of Tokyo

PROFESSIONAL APPOINTMENTS

- 2024 Postdoctoral Fellow, Massachusetts Institute of Technology
- 2020 Postdoctoral Fellow, Lawrence Berkeley National Laboratory
- 2020 Postdoctoral Fellow, High Energy Accelerator Research Organization (KEK)

AWARDS AND HONORS

- 2020 Best presentation award for young scientists for Unraveling the History of the Universe 2020
- 2019 Best Poster Award for HPNP 2019

GRANTS AND FELLOWSHIPS

- 2020 Research Fellowships for Young Scientists (PD), JSPS (3100000 JPY)
- 2017 Research Fellowships for Young Scientists (DC1), JSPS (2800000 JPY)
- 2015 Program for Leading Graduate Schools, MEXT

TEACHING EXPERIENCES

- 2015 Teaching Assistant for an undergraduate course “Quantum Mechanics II”, Department of Physics, University of Tokyo, Apr.–Sep.

PUBLICATIONS

- [1] S. Chigusa, T. Kasamaki, T. Kusano, T. Moroi, K. Nakayama, N. Ozawa et al., *Dark matter detection using optically trapped Rydberg atom tweezer arrays*, 2507.12860.
- [2] S. Chigusa, S. Girmohanta, Y. Nakai and Y. Zhang, *Interplay of ALP couplings at a muon collider*, *JHEP* **07** (2025) 003 [2502.18912].

- [3] E.D. Herbschleb, S. Chigusa, R. Kawase, H. Kawashima, M. Hazumi, K. Nakayama et al., *Robust sensing via the standard deviation with a quantum sensor*, *APL Quantum* **1** (2024) 046106.
- [4] T. Sichanugrist, H. Fukuda, T. Moroi, K. Nakayama, S. Chigusa, N. Mizuochi et al., *Entanglement-enhanced ac magnetometry in the presence of Markovian noise*, *Phys. Rev. A* **111** (2025) 042605 [2410.21699].
- [5] S. Chigusa, M. Hazumi, E.D. Herbschleb, Y. Matsuzaki, N. Mizuochi and K. Nakayama, *Nuclear spin metrology with nitrogen vacancy center in diamond for axion dark matter detection*, *Phys. Rev. D* **111** (2025) 075028 [2407.07141].
- [6] C.W. Bauer, S. Chigusa and M. Yamazaki, *Quantum parton shower with kinematics*, *Phys. Rev. A* **109** (2024) 032432 [2310.19881].
- [7] S. Chigusa, A. Ito, K. Nakayama and V. Takhistov, *Effects of finite material size on axion-magnon conversion*, *JHEP* **01** (2024) 185 [2310.17704].
- [8] S. Chigusa, S. Girmohanta, Y. Nakai and Y. Zhang, *Aiming for tops of ALPs with a muon collider*, *JHEP* **01** (2024) 077 [2310.11018].
- [9] S. Chigusa, D. Kondo, H. Murayama, R. Okabe and H. Sudo, *Axion detection via superfluid ^3He ferromagnetic phase and quantum measurement techniques*, *JHEP* **09** (2024) 191 [2309.09160].
- [10] S. Chigusa, T. Moroi, K. Nakayama and T. Sichanugrist, *Dark matter detection using nuclear magnetization in magnet with hyperfine interaction*, *Phys. Rev. D* **108** (2023) 095007 [2307.08577].
- [11] S. Chigusa, T. Moroi and Y. Shoji, *Stability of electroweak vacuum and supersymmetric contribution to muon $g - 2$* , *JHEP* **11** (2023) 027 [2306.16596].
- [12] S. Chigusa, M. Hazumi, E.D. Herbschleb, N. Mizuochi and K. Nakayama, *Light dark matter search with nitrogen-vacancy centers in diamonds*, *JHEP* **03** (2025) 083 [2302.12756].
- [13] S. Chigusa and M. Yamazaki, *Quantum simulations of dark sector showers*, *Phys. Lett. B* **834** (2022) 137466 [2204.12500].
- [14] S. Chigusa, T. Moroi and Y. Shoji, *Upper bound on the smuon mass from vacuum stability in the light of muon $g-2$ anomaly*, *Phys. Lett. B* **831** (2022) 137163 [2203.08062].

- [15] S. Chigusa, S. Li, Y. Nakai, W. Zhang, Y. Zhang and J. Zheng, *Deeply learned preselection of Higgs dijet decays at future lepton colliders*, *Phys. Lett. B* **833** (2022) 137301 [2202.02534].
- [16] S. Chigusa, K. Hamaguchi, T. Moroi, A. Niki and K. Ono, *Studying squark mass spectrum through gluino decay at 100 TeV future hadron colliders*, *Phys. Lett. B* **817** (2021) 136332 [2102.07910].
- [17] S. Chigusa, T. Moroi and K. Nakayama, *Axion/hidden-photon dark matter conversion into condensed matter axion*, *JHEP* **08** (2021) 074 [2102.06179].
- [18] S. Chigusa, Y. Nakai and J. Zheng, *Implications of gravitational waves for supersymmetric grand unification*, *Phys. Rev. D* **104** (2021) 035031 [2011.04090].
- [19] S. Chigusa, T. Moroi and Y. Shoji, *Precise Calculation of the Decay Rate of False Vacuum with Multi-Field Bounce*, *JHEP* **11** (2020) 006 [2007.14124].
- [20] S. Chigusa, M. Endo and K. Kohri, *Constraints on electron-scattering interpretation of XENONIT excess*, *JCAP* **10** (2020) 035 [2007.01663].
- [21] S. Chigusa, T. Moroi and K. Nakayama, *Detecting light boson dark matter through conversion into a magnon*, *Phys. Rev. D* **101** (2020) 096013 [2001.10666].
- [22] S. Chigusa, *Probing Electroweakly Interacting Massive Particles with Drell-Yan Process at 100 TeV Colliders*, Ph.D. thesis, Tokyo U., 2020.
- [23] S. Chigusa, Y. Hosomi, T. Moroi and M. Saito, *Determining Wino Lifetime in Supersymmetric Model at Future 100 TeV pp Colliders*, *Phys. Lett. B* **803** (2020) 135260 [1912.00592].
- [24] S. Chigusa, T. Moroi and K. Nakayama, *Signals of Axion Like Dark Matter in Time Dependent Polarization of Light*, *Phys. Lett. B* **803** (2020) 135288 [1911.09850].
- [25] S. Chigusa, T. Moroi and Y. Shoji, *Bounce Configuration from Gradient Flow*, *Phys. Lett. B* **800** (2020) 135115 [1906.10829].
- [26] S. Chigusa, S. Kasuya and K. Nakayama, *Novel Flavon Stabilization with Trimaximal Neutrino Mixing*, *Phys. Rev. D* **100** (2019) 015030 [1905.11517].
- [27] T. Abe, S. Chigusa, Y. Ema and T. Moroi, *Indirect studies of electroweakly interacting particles at 100 TeV hadron colliders*, *Phys. Rev. D* **100** (2019) 055018 [1904.11162].
- [28] S. Asai, S. Chigusa, T. Kaji, T. Moroi, M. Saito, R. Sawada et al., *Studying gaugino masses in supersymmetric model at future 100 TeV pp collider*, *JHEP* **05** (2019) 179 [1901.10389].

- [29] S. Chigusa, Y. Ema and T. Moroi, *Probing electroweakly interacting massive particles with Drell–Yan process at 100 TeV hadron colliders*, *Phys. Lett. B* **789** (2019) 106 [1810.07349].
- [30] S. Chigusa, S. Kasuya and K. Nakayama, *Flavon Stabilization in Models with Discrete Flavor Symmetry*, *Phys. Lett. B* **788** (2019) 494 [1810.05791].
- [31] S. Chigusa and K. Nakayama, *Anomalous Discrete Flavor Symmetry and Domain Wall Problem*, *Phys. Lett. B* **788** (2019) 249 [1808.09601].
- [32] S. Chigusa, T. Moroi and Y. Shoji, *Decay Rate of Electroweak Vacuum in the Standard Model and Beyond*, *Phys. Rev. D* **97** (2018) 116012 [1803.03902].
- [33] S. Chigusa, T. Moroi and Y. Shoji, *State-of-the-Art Calculation of the Decay Rate of Electroweak Vacuum in the Standard Model*, *Phys. Rev. Lett.* **119** (2017) 211801 [1707.09301].
- [34] S. Chigusa and T. Moroi, *Bottom-Tau Unification in Supersymmetric $SU(5)$ Models with Extra Matters*, *PTEP* **2017** (2017) 063B05 [1702.00790].
- [35] S. Chigusa and T. Moroi, *Bottom-tau unification in a supersymmetric model with anomaly-mediation*, *Phys. Rev. D* **94** (2016) 035016 [1604.02156].

INVITED SEMINAR TALKS

PRESENTATIONS AT INTERNATIONAL CONFERENCES

(Poster)

PRESENTATIONS AT DOMESTIC CONFERENCES

(Poster)

SERVICE TO PROFESSION

Journal manuscript review work of the following journals

- Nature Communications
- Physical Review Letters
- Physical Review B
- Physical Review D
- Physics Letters B
- Journal of High Energy Physics
- Progress of Theoretical and Experimental Physics

SKILLS

Languages: English – Fluent, Japanese – Native

Computer: c++, Mathematica, Python, LaTeX