

CURRICULUM VITAE

PERSONAL DATA

NAME IN FULL: Katsuya Abe
GENDER: Male
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EMPLOYMENT

Apr. 2023 - present	Postdoctoral Researcher, Center for Frontier Science, Chiba University, Chiba
Apr. 2024 - July 2024	Part-time Teacher, Shumei University, Chiba
Apr. 2024 - July 2024	Part-time Teacher, Tokyo City University, Tokyo

EDUCATION

Mar. 2023 (expected)	PHD, PHYSICS Department of Physics, Graduate School of Science, Nagoya University. Thesis: Probing primordial scalar perturbations on small scales
Mar. 2020	M.S., PHYSICS Division of Particle and Astrophysical Science, Graduate School of Science, Nagoya University. Thesis: Primordial black holes and cosmic microwave background anisotropy
Mar. 2018	B.S., PHYSICS Department of Physics, School of Science, Nagoya University.

FELLOWSHIP

Apr. 2020 - Mar. 2023 (expected)	Japan Society for the Promotion of Science, Young scientist (DC1), Nagoya University, Aichi. Science, Cosmology group. Research budget (3,100,000yen) Stipend (2,400,000yen per annum)
Oct. 2018 - Mar. 2023 (expected)	PhD Professional Toryumon Nagoya University, Program for Leading Graduate School. Research budget (700,000yen) Stipend (2,400,000yen per annum)

RESEARCH INTEREST

SMALL-SCALE STRUCTURES

- Dark matter halos
- Ultracompact minihalos

PRIMORDIAL BLACK HOLES

- Dark matter, gravitational wave
- Abundance of primordial black holes

PUBLICATIONS

Accepted

1. K. T. Abe and H. Tashiro, “CMB lensing from early-formed dark matter halos,” Phys. Rev. D **109**, no.10, 103524 (2024) [doi:10.1103/PhysRevD.109.103524](https://doi.org/10.1103/PhysRevD.109.103524) [[arXiv:2401.00407](https://arxiv.org/abs/2401.00407)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
2. K. T. Abe, H. Kawai and M. Oguri, “Analytic approach to astrometric perturbations of critical curves by substructures,” Phys. Rev. D **109**, no.8, 083517 (2024) [doi:10.1103/PhysRevD.109.083517](https://doi.org/10.1103/PhysRevD.109.083517) [[arXiv:2311.18211](https://arxiv.org/abs/2311.18211)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
3. K. T. Abe and Y. Tada, “Translating nano-Hertz gravitational wave background into primordial perturbations taking account of the cosmological QCD phase transition,” Phys. Rev. D **108**, no.10, L101304 (2023) [doi:10.1103/PhysRevD.108.L101304](https://doi.org/10.1103/PhysRevD.108.L101304) [[arXiv:2307.01653](https://arxiv.org/abs/2307.01653)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
4. K. T. Abe, R. Inui, Y. Tada and S. Yokoyama, “Primordial black holes and gravitational waves induced by exponential-tailed perturbations,” JCAP **05**, 044 (2023) [doi:10.1088/1475-7516/2023/05/044](https://doi.org/10.1088/1475-7516/2023/05/044) [[arXiv:2209.13891](https://arxiv.org/abs/2209.13891)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
5. K. T. Abe, “Cosmological contribution from population III stars in ultracompact minihalos,” Phys. Rev. D **106**, no.8, 083521 (2022) [doi:10.1103/PhysRevD.106.083521](https://doi.org/10.1103/PhysRevD.106.083521) [[arXiv: 2208.00375](https://arxiv.org/abs/2208.00375)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
6. K. T. Abe and H. Tashiro, “Cosmological free-free emission from dark matter halos in the Λ CDM model,” Phys. Rev. D **106**, no.6, 063523 (2022) [doi:10.1103/PhysRevD.106.063523](https://doi.org/10.1103/PhysRevD.106.063523) [[arXiv: 2206.11261](https://arxiv.org/abs/2206.11261)] [[astro-ph.CO](https://arxiv.org/archive/astro)].
7. K. T. Abe, T. Minoda and H. Tashiro, “Constraint on the early-formed dark matter halos using the free-free emission in the Planck foreground analysis,” Phys. Rev. D **105**, no.6, 063531 (2022) [doi:10.1103/PhysRevD.105.063531](https://doi.org/10.1103/PhysRevD.105.063531) [[arXiv: 2108.00621](https://arxiv.org/abs/2108.00621)] [[astro-ph.CO](https://arxiv.org/archive/astro)].

8. K. T. Abe, Y. Tada and I. Ueda, “Induced gravitational waves as a cosmological probe of the sound speed during the QCD phase transition,” JCAP **06**, 048 (2021) [doi:10.1088/1475-7516/2021/06/048](#) [[arXiv: 2010.06193](#) [[astro-ph.CO](#)]].
9. K. T. Abe and H. Tashiro, “Population III star explosions and Planck 2018 data,” Phys. Rev. D **103**, no.12, 123543 (2021) [doi:10.1103/PhysRevD.103.123543](#) [[arXiv:2103.01643](#) [[astro-ph.CO](#)]].
10. K. Furugori, K. T. Abe, T. Tanaka, D. Hashimoto, H. Tashiro and K. Hasegawa, “The 21-cm signals from ultracompact minihaloes as a probe of primordial small-scale fluctuations,” Mon. Not. Roy. Astron. Soc. **494**, no.3, 4334-4342 (2020) [doi:10.1093/mnras/staa1033](#) [[arXiv: 2002.04817](#) [[astro-ph.CO](#)]].
11. K. T. Abe, H. Tashiro and T. Tanaka, “Thermal Sunyaev-Zel’dovich anisotropy due to primordial black holes,” Phys. Rev. D **99**, no.10, 103519 (2019) [doi:10.1103/PhysRevD.99.103519](#) [[arXiv: 1901.06809](#) [[astro-ph.CO](#)]].

Submitted

1. T. Broadhurst, S. K. Li, A. Alfred, J. M. Diego, P. Morilla, P. L. Kelly, F. Sun, M. Oguri, H. Williams and R. Windhorst, *et al.* [[arXiv:2405.19422](#) [[astro-ph.CO](#)]].
2. Y. Fudamoto, F. Sun, J. M. Diego, L. Dai, M. Oguri, A. Zitrin, E. Zackrisson, M. Jauzac, D. J. Lagattuta and E. Egami, *et al.* [[arXiv:2404.08045](#) [[astro-ph.GA](#)]].
3. H. Tashiro, K. T. Abe and T. Minoda, “Free-free background radiation from accreting primordial black holes,” [[arXiv:2108.01916](#) [[astro-ph.CO](#)]].

PRESENTATIONS

27th Nov. 2023	Translating nano-Hertz gravitational wave background into primordial perturbations taking account of the cosmological QCD phase transition , <i>JGRG 2023</i> , Nagoya U. , <u>K. T. Abe</u> , and Y. Tada (oral)
6th July 2021	Constraint on the dark matter halo formation in the early universe by the free-free emission , <i>Sixteenth Marcel Grossmann Meeting</i> , online, <u>K. T. Abe</u> , T. Minoda and H. Tashiro (oral, refereed)
24th Nov. 2020	Induced gravitational wave as a cosmological probe of the sound speed during the QCD phase transition , <i>Online JGRG 2020</i> , online, <u>K. T. Abe</u> , Y. Tada, I. Ueda (oral)
26th Aug. 2020	Induced gravitational wave as a cosmological probe of the sound speed during the QCD phase transition , <i>IBS & KMI Joint Workshop 2020</i> , online, <u>K. T. Abe</u> , Y. Tada, I. Ueda (oral)
25th Nov. 2019	Small-scale CMB anisotropy due to PBH , <i>JGRG29</i> , Kobe University, <u>K. T. Abe</u> , H. Tashiro (oral refereed)
4th Sep. 2019	Kinetic Sunyaev-Zel'dovich anisotropy induced from PBH , <i>COSMO19</i> , RWTH Aachen University, <u>K. T. Abe</u> , H. Tashiro (poster)
15th May 2019	Thermal Sunyaev-Zel'dovich anisotropy due to Primordial black holes , <i>Axion Cosmology</i> , Kyoto University, <u>K. T. Abe</u> , H. Tashiro (oral)
11th Dec. 2018	Constraint on the abundance of primordial black holes with Sunyaev-Zel'dovich effects , <i>XII Tonale Winter School in Cosmology</i> , Tonale Italy, <u>K. T. Abe</u> , H. Tashiro (poster)

AWARDS AND HONORS

6th Sep. 2022	Outstanding Student Presentation Award , The Physical Society of Japan, autumn meeting 2022.
13th Dec. 2019	Best award in master thesis presentation , Nagoya University, Graduate School of Science, Physics.
22th July 2018	Oral award , 48th Summer school for young scientists in gravity and cosmology session.

TECHNICAL SKILLS

SOFTWARE AND COMPUTING – C, C++, MATHEMATICA, Python and parallel processing
LANGUAGES (PROFICIENT IN) – Japanese and English (IELTS overall score 6.0)