

CURRICULUM VITAE

PERSONAL DATA

NAME IN FULL: Katsuya Abe
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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, “Cosmological contribution from population III stars in ultracompact mini-halos,” *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 \[astro-ph.CO\]](https://arxiv.org/abs/2208.00375))
2. 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 \[astro-ph.CO\]](https://arxiv.org/abs/2206.11261))
3. 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 \[astro-ph.CO\]](https://arxiv.org/abs/2108.00621))
4. 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](https://doi.org/10.1088/1475-7516/2021/06/048), [arXiv: 2010.06193 \[astro-ph.CO\]](https://arxiv.org/abs/2010.06193))
5. 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](https://doi.org/10.1103/PhysRevD.103.123543), [arXiv:2103.01643 \[astro-ph.CO\]](https://arxiv.org/abs/2103.01643))
6. 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](https://doi.org/10.1093/mnras/staa1033), [arXiv: 2002.04817 \[astro-ph.CO\]](https://arxiv.org/abs/2002.04817))
7. 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](https://doi.org/10.1103/PhysRevD.99.103519), [arXiv: 1901.06809 \[astro-ph.CO\]](https://arxiv.org/abs/1901.06809))

Submitted

1. K. T. Abe, R. Inui, Y. Tada and S. Yokoyama, “Primordial black holes and gravitational waves induced by exponential-tailed perturbations,” ([arXiv: 2209.13891 \[astro-ph.CO\]](https://arxiv.org/abs/2209.13891))
2. H. Tashiro, K. T. Abe and T. Minoda, “Free-free background radiation from accreting primordial black holes,” ([arXiv:2108.01916 \[astro-ph.CO\]](https://arxiv.org/abs/2108.01916))

PRESENTATIONS

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| 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, K. T. Abe , 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, K. T. Abe , Y. Tada, I. Ueda (oral, refereed) |
| 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, K. T. Abe , Y. Tada, I. Ueda (oral) |
| 25th Nov. 2019 | Small-scale CMB anisotropy due to PBH , <i>JGRG29</i> , Kobe University, K. T. Abe , H. Tashiro (oral refereed) |
| 4th Sep. 2019 | Kinetic Sunyaev-Zel'dovich anisotropy induced from PBH , <i>COSMO19</i> , RWTH Aachen University, K. T. Abe , H. Tashiro (poster, refereed) |
| 15th May 2019 | Thermal Sunyaev-Zel'dovich anisotropy due to Primordial black holes , <i>Axion Cosmology</i> , Kyoto University, K. T. Abe , H. Tashiro (oral, refereed) |
| 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, K. T. Abe , H. Tashiro (poster) |

AWARDS AND HONORS

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| 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)

REFERENCES

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|--------------------|---|
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| Hiroyuki Tashiro | Project Associate Professor
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| Shuichiro Yokoyama | Assistant Professor
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