

Yuichiro Tada

Curriculum Vitae

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1st January 1989



Employment & Fellowship

- Apr. 2019– **Part-time Lecturer**, *Daido University*, Nagoya, Japan.
Present Classical mechanics 1, 2
- Apr. 2018– **JSPS Fellow PD**, *Nagoya University*, Nagoya, Japan.
Present Cosmology group
- Apr. 2017– **Post-Doctoral Researcher**, *Institut d'Astrophysique de Paris*, Paris, France.
Mar. 2018 Dr. Sébastien Renaux-Petel's Group
- Apr. 2015– **JSPS Fellow DC2**, *The University of Tokyo*, Chiba, Japan.
Mar. 2017 Kavli IPMU & ICRR
- Oct. 2012– **ALPS Fellow**, *The University of Tokyo*, Chiba, Japan.
Mar. 2017 Kavli IPMU & ICRR

Education

- 23rd Mar. **Ph.D. in physics**, *The University of Tokyo*, Chiba, Japan.
2017 Department of Physics. Advisor: Masahiro Kawasaki, Hitoshi Murayama
- 24th Mar. **Master of Science in physics**, *The University of Tokyo*, Tokyo, Japan.
2014 Department of Physics. Advisor: Masahiro Kawasaki, Hitoshi Murayama
- 23rd Mar. **Bachelor of Science in physics**, *The University of Tokyo*, Tokyo, Japan.
2012 Department of Physics

Research Interest

Inflation

- stochastic effect, δN formalism, non-Gaussianity
- supergravity, grand unified theory, modified gravity
- curved target space

Primordial Black Hole

- gravitational waves, bias/cluster effect

Helical Particle Production

- inflationary magnetogenesis, helical gravitational waves, lepto/baryogenesis

Publications

20. T. Suyama, Y. Tada and M. Yamaguchi, **Local observer effect on the cosmological soft theorem**, [[arXiv:2008.13364](#) [[astro-ph.CO](#)]].
19. L. Pinol, S. Renaux-Petel and Y. Tada, **A manifestly covariant theory of multifield stochastic inflation in phase space**, [[arXiv:2008.07497](#) [[astro-ph.CO](#)]].
18. Y. Mikura, Y. Tada and S. Yokoyama, **Conformal inflation in the metric-affine geometry**, [[arXiv:2008.00628](#) [[hep-th](#)]].
17. K. Kogai and Y. Tada, **Escape from the swampland with a spectator field**, *Phys. Rev. D* **101**, no.10, 103514 (2020) [[arXiv:2003.06753](#) [[astro-ph.CO](#)]].
16. N. Kitajima, Y. Tada and F. Takahashi, **Stochastic inflation with an extremely large number of e -folds**, *Phys. Lett. B* **800**, 135097 (2020) [[arXiv:1908.08694](#) [[hep-ph](#)]].
15. Y. Tada and S. Yokoyama, **Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes**, *Phys. Rev. D* **100**, no. 2, 023537 (2019) [[arXiv:1904.10298](#) [[astro-ph.CO](#)]].
14. L. Pinol, S. Renaux-Petel and Y. Tada, **Inflationary stochastic anomalies**, *Class. Quant. Grav.* **36**, no. 7, 07LT01 (2019) [[arXiv:1806.10126](#) [[gr-qc](#)]].
13. K. Inomata, M. Kawasaki, K. Mukaida, Y. Tada and T. T. Yanagida, **$\mathcal{O}(10)M_{\odot}$ primordial black holes and string axion dark matter**, *Phys. Rev. D* **96**, no. 12, 123527 (2017) [[arXiv:1709.07865](#) [[astro-ph.CO](#)]].
12. T. Fujita, R. Namba and Y. Tada, **Does the detection of primordial gravitational waves exclude low energy inflation?**, *Phys. Lett. B* **778**, 17 (2018) [[arXiv:1705.01533](#) [[astro-ph.CO](#)]].
11. K. Inomata, M. Kawasaki, K. Mukaida, Y. Tada and T. T. Yanagida, **Inflationary Primordial Black Holes as All Dark Matter**, *Phys. Rev. D* **96**, no. 4, 043504 (2017) [[arXiv:1701.02544](#) [[astro-ph.CO](#)]].
10. K. Inomata, M. Kawasaki, K. Mukaida, Y. Tada and T. T. Yanagida, **Inflationary primordial black holes for the LIGO gravitational wave events and pulsar timing array experiments**, *Phys. Rev. D* **95**, no. 12, 123510 (2017) [[arXiv:1611.06130](#) [[astro-ph.CO](#)]].
9. Y. Tada and V. Vennin, **Squeezed Bispectrum in the δN Formalism: Local Observer Effect in Field Space**, *JCAP* **1702**, no. 02, 021 (2017) [[arXiv:1609.08876](#) [[astro-ph.CO](#)]].
8. M. Kawasaki, A. Kusenko, Y. Tada and T. T. Yanagida, **Primordial black holes as dark matter in supergravity inflation models**, *Phys. Rev. D* **94**, no. 8, 083523 (2016) [[arXiv:1606.07631](#) [[astro-ph.CO](#)]].
7. K. Inomata, M. Kawasaki and Y. Tada, **Revisiting constraints on small scale perturbations from big-bang nucleosynthesis**, *Phys. Rev. D* **94**, no. 4, 043527 (2016) [[arXiv:1605.04646](#) [[astro-ph.CO](#)]].

6. M. Kawasaki and Y. Tada, **Can massive primordial black holes be produced in mild waterfall hybrid inflation?**, *JCAP* **1608**, no. 08, 041 (2016) [[arXiv:1512.03515 \[astro-ph.CO\]](#)].
5. T. Fujita, R. Namba, Y. Tada, N. Takeda and H. Tashiro, **Consistent generation of magnetic fields in axion inflation models**, *JCAP* **1505**, no. 05, 054 (2015) [[arXiv:1503.05802 \[astro-ph.CO\]](#)].
4. Y. Tada and S. Yokoyama, **Primordial black holes as biased tracers**, *Phys. Rev. D* **91**, no. 12, 123534 (2015) [[arXiv:1502.01124 \[astro-ph.CO\]](#)].
3. A. Ota, T. Sekiguchi, Y. Tada and S. Yokoyama, **Anisotropic CMB distortions from non-Gaussian isocurvature perturbations**, *JCAP* **1503**, no. 03, 013 (2015) [[arXiv:1412.4517 \[astro-ph.CO\]](#)].
2. T. Fujita, M. Kawasaki and Y. Tada, **Non-perturbative approach for curvature perturbations in stochastic δN formalism**, *JCAP* **1410**, no. 10, 030 (2014) [[arXiv:1405.2187 \[astro-ph.CO\]](#)].
1. T. Fujita, M. Kawasaki, Y. Tada and T. Takesako, **A new algorithm for calculating the curvature perturbations in stochastic inflation**, *JCAP* **1312**, 036 (2013) [[arXiv:1308.4754 \[astro-ph.CO\]](#)].

Ph.D. thesis **Curvature Perturbations and Primordial Black Hole Formation in the Inflationary Universe.**

Department of Physics, The University of Tokyo, Bunkyo-ku, Tokyo 113-0033, Japan
 Kavli Institute for the Physics and Mathematics of the Universe (WPI), UTIAS, The University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8583, Japan
 Institute for Cosmic Ray Research, The University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8582, Japan

Master thesis **The stochastic approach to the inflationary universe (in Japanese).**

Department of Physics, The University of Tokyo, Bunkyo-ku, Tokyo 113-0033, Japan
 Kavli Institute for the Physics and Mathematics of the Universe (WPI), UTIAS, The University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8583, Japan

Conferences

- 20th Aug. 2020 **Manifestly covariant theory of stochastic inflation**, *The 14th International Conference on Gravitation, Astrophysics and Cosmology (ICGAC14)*, National Central University, Taiwan (Web Conference), L. Pinol, S. Renaux-Petel, Y. Tada, V. Vennin.
 oral, refereed
- 6th Dec. 2019 **Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes**, *Focus Week on Primordial Black Holes*, Kavli IPMU, Y. Tada and S. Yokoyama.
 oral, refereed
- 27th Nov. 2019 **Stochastic inflation with an extremely large number of e-folds**, *The 29th Workshop on General Relativity and Gravitation in Japan (JGRG29)*, Kobe University, N. Kitajima, Y. Tada, and F. Takahashi.
 oral, refereed

- 19th Nov. **Stochastic approach to non-Gaussianity**, *Theoretical aspects of non-Gaussianity from modern perspectives*, Kyoto University, Y. Tada and V. Vennin.
2019 oral, refereed
- 16th Oct. **Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes**, *Gravitational Wave Physics and Astronomy Workshop (GWPAW 2019)*, The University of Tokyo, Y. Tada and S. Yokoyama.
2019 oral, refereed
- 4th Sep. **Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes**, *COSMO19*, Aachen University, Y. Tada and S. Yokoyama.
2019 poster, refereed
- 16th Aug. **Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes**, *15th Rencontres du Vietnam "COSMOLOGY"*, ICISE, Y. Tada and S. Yokoyama.
2019 oral, invited
- 13th Jun. **Stochastic formalism and curvature perturbation**, *3-day workshop: INFLATION AND GEOMETRY*, IAP, T. Fujita, L. Pinol, S. Renaux-Petel, Y. Tada, J. Tokuda, and V. Vennin.
2019 oral, invited
- 15th May **PBH tower in multi-phase inflation**, *2-day mini-workshop: Axion Cosmology*, Kyoto University, Y. Tada and S. Yokoyama.
2019 oral, refereed
- 3rd Apr. **PBH tower in multi-phase inflation**, *Future Perspective in Cosmology and Gravity*, Nagoya University, Y. Tada and S. Yokoyama.
2019 oral, refereed
- 7th Mar. **PBH tower in multi-phase inflation**, *Accelerating Universe in the Dark*, Kyoto University, Y. Tada and S. Yokoyama.
2019 oral, refereed
- 19th Feb. **Aspects of primordial black hole as dark matter**, *FAPESP-JSPS Workshop on dark energy, dark matter, and galaxies*, University of Sao Paulo, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, T. T. Yanagida, and S. Yokoyama.
2019 oral, refereed
- 8th Nov. **Stochastic formalism and curvature perturbations**, *The 28th Workshop on General Relativity and Gravitation in Japan (JGRG28)*, Rikkyo University, T. Fujita, L. Pinol, S. Renaux-Petel, Y. Tada, and J. Tokuda.
2018 oral, refereed
- 10th Aug. **Stochastic inflation in a general field space**, *International Conference on Modified Gravity 2018 (MOGRA 2018)*, Nagoya University, T. Fujita, L. Pinol, S. Renaux-Petel, Y. Tada, and J. Tokuda.
2018 oral, refereed

- 5th Jul. 2018 **Stochastic inflation in a general field space**, *Fifteenth Marcel Grossmann Meeting*, University of Rome “La Sapienza”, T. Fujita, L. Pinol, S. Renaux-Petel, Y. Tada, and J. Tokuda.
oral, refereed
- 20th–21st Jan. 2018 **Subtleties in stochastic formalism - Ito vs. Stratonovich**, *Infrared physics of gauge theories and quantum dynamics of inflation*, Shiga, L. Pinol, S. Renaux-Petel, and Y. Tada.
oral, refereed
- 28th Aug.–1st Sep. 2017 **Stochastic Formalism in Curved Field Space**, *The 21st annual International Conference on Particle Physics and Cosmology (COSMO-17)*, The Universite Paris Diderot site, Amphitheatre Buffon, L. Pinol, S. Renaux-Petel, and Y. Tada.
oral, refereed
- 27th May–2nd Jun. 2017 **Primordial Black Hole, Dark Matter, and Gravitational Wave**, *Gordon Research Conference & Seminars “String Theory & Cosmology”*, Renaissance Tuscany Il Ciocco, Lucca (Barga), Italy, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, and T. T. Yanagida.
poster, refereed
- 24th–28th Oct. 2016 **Squeezed Bispectrum in the delta N Formalism without Gauge Artifact**, *The 26th Workshop on General Relativity and Gravitation in Japan (JGRG26)*, Osaka City University, Y. Tada and V. Vennin.
oral, refereed
- 24th–28th Aug. 2016 **PBH Dark Matter in Supergravity Inflation Models**, *RESCEU Summer School*, Gifu, M. Kawasaki, A. Kusenko, Y. Tada, and T. T. Yanagida.
oral, not refereed
- 14th–18th Dec. 2015 **Can massive primordial black holes be produced in mild waterfall hybrid inflation?**, *Second LeCosPA International Symposium “Everything About Gravity”*, National Taiwan University, M. Kawasaki and Y. Tada.
oral, refereed
- 7th–11th Sep. 2015 **PRIMORDIAL BLACK HOLES AS BIASED TRACERS**, *International Conference on Particle Physics and Cosmology (COSMO-15)*, The University of Warsaw, Y. Tada and S. Yokoyama.
oral, refereed
- 25th–29th Aug. 2014 **Non-perturbative approach for curvature perturbations in stochastic-delta N formalism**, *International Conference on Particle Physics and Cosmology (COSMO 2014)*, The Kavli Institute for Cosmological Physics (KICP), The University of Chicago, T. Fujita, M. Kawasaki, and Y. Tada.
poster, refereed
- 30th Sep.–3rd Oct. 2013 **A new algorithm for calculating the curvature perturbations in stochastic inflation**, *KEK Theory Meeting on Particle Physics Phenomenology (KEK-PH2013 FALL)*, KEK, T. Fujita, M. Kawasaki, Y. Tada, and T. Takesako.
oral, refereed

Seminars

- 7th Jun. 2019 **Aspects of primordial black holes and implication to multi-phase inflation**, *IRAP*, Toulouse, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, T. T. Yanagida, and S. Yokoyama.
- 23rd May 2019 **Aspects of primordial black holes and implication to multi-phase inflation**, *Tohoku University*, Miyagi, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, T. T. Yanagida, and S. Yokoyama.
invited
- 26th Jun. 2018 **Stochastic inflation in a general field space**, *Laboratoire Astroparticule et Cosmologie*, Paris, T. Fujita, L. Pinol, S. Renaux-Petel, Y. Tada, and J. Tokuda.
- 20th Sep. 2017 **Stochastic Formalism in Curved Field Space**, *Nagoya University*, Aichi, L. Pinol, S. Renaux-Petel, and Y. Tada.
- 19th Sep. 2017 **Stochastic Formalism in Curved Field Space**, *Kobe University*, Hyogo, L. Pinol, S. Renaux-Petel, and Y. Tada.
- 4th Sep. 2017 **Stochastic Formalism in Curved Field Space**, *RESCEU*, Tokyo, L. Pinol, S. Renaux-Petel, and Y. Tada.
- 20th Apr. 2017 **Primordial Black Hole, Dark Matter, and LIGO's Gravitational Wave Event**, *Institut Astrophysique de Paris*, Paris, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, and T. T. Yanagida.
- 16th Dec. 2016 **Primordial Black Hole, Dark Matter, and LIGO's Gravitational Wave Event**, *Waseda University*, Tokyo, K. Inomata, M. Kawasaki, A. Kusenko, K. Mukaida, Y. Tada, and T. T. Yanagida.
invited
- 22nd Jun. 2016 **Stochastic-delta N formalism and massive primordial black hole formation in hybrid inflation**, *Institute of Cosmology and Gravitation*, Portsmouth, M. Kawasaki and Y. Tada.
- 18th Apr. 2016 **Stochastic-delta N formalism and massive primordial black holes in hybrid inflation**, *The University of Tokyo*, Tokyo, M. Kawasaki and Y. Tada.
invited
- 29th Mar. 2016 **Stochastic-delta N formalism and massive primordial black holes in hybrid inflation**, *Kyoto University*, Kyoto, M. Kawasaki and Y. Tada.
- 29th Feb. 2016 **Can massive primordial black holes be produced in mild waterfall hybrid inflation?**, *RESCEU*, Tokyo, M. Kawasaki and Y. Tada.
invited
- 27th Jun. 2016 **Stochastic-delta N formalism and massive primordial black holes in hybrid inflation**, *KEK*, Ibaraki, M. Kawasaki and Y. Tada.
- 14th–18th Sep. 2015 **Stochastic-delta N formalism and primordial black holes in hybrid inflation**, *University of Padova*, Padova, M. Kawasaki and Y. Tada.

- 21th Sep. **Stochastic- δN formalism and primordial black holes in hybrid inflation**, *Institut*
2015 *Astrophysique de Paris*, Paris, M. Kawasaki and Y. Tada.
- 16th Feb. **Primordial black holes as biased tracers**, *Joint seminar of gravity and cosmology @*
2015 *IPMU*, Chiba, Y. Tada and S. Yokoyama.
- 19th Aug. **Stochastic- δN formalism**, *Helsinki University*, Helsinki, T. Fujita, M. Kawasaki, Y.
2014 Tada, and T. Takesako.

Activities

- 1st Oct.– **Study abroad**, *Helsinki University*, Prof. Enqvist group.
22 Dec. coursework of ALPS fellowship
2014

Peer review.

European Physical Journal C (EPJC), Journal of Cosmology and Astroparticle Physics (JCAP),
Modern Physics Letters A (MPLA), Physical Review D (PRD), Progress of Theoretical and
Experimental Physics (PTEP), Universe

Science member, *International Research Network Extragalactic astrophysics and
Cosmology (NECO)*.

Awards and Honors

- 27th Nov. **Outstanding Presentation Award Gold Prize**, *Online JGRG Workshop 2020*.
2020
- Feb. 2019 **Young representative speaker**, *FAPESP-JSPS Workshop on dark energy, dark matter,
and galaxies*.
- 24th Mar. **Director's Award**, *ICRR Master and Doctor Thesis Workshop*, Institute for Cosmic
2017 Ray Research, The University of Tokyo.

Funding

- 1st Apr. **JSPS Grant-in-Aid for Early-Career Scientists**, *Aspects of gravity and quantum the-*
2019–31st *ory in the stochastic formalism*.
Mar. 2021 No. 19K14707, Principal Investigator, ¥1,560,000
- 25th Apr. **Grant-in-Aid for JSPS Fellows**, *Curvature Perturbations and Primordial Black Hole*
2018–31st *Formation in the Inflationary Universe*.
Mar. 2021 No. 18J01992, JSPS Fellow (PD), ¥3,640,000