

Curriculum Vitae

Hiroki Takeda

Address:

Theoretical Astrophysics Group
Department of Physics
Kyoto university
Kyoto 606-8502, Japan

Phone: +81-75-753-3872

E-mail takeda@tap.scphys.kyoto-u.ac.jp

URL <https://hiroki-takeda.github.io/index.html>

Date of birth: October 5, 1993

Education

- 2018-2021 Doctor of Philosophy, University of Tokyo
 Tests of Alternative Theories of Gravity through Gravitational-Wave Polarizations, Completion Date: March, 2021
- 2016-2018 Master of Science in Physics, University of Tokyo
 Development of Monolithic Optical System for Lorentz Invariance Test,
 Completion Date: March, 2018
- 2012-2016 Bachelor of Science in Physics, Yokohama National University
 Proposal of Rayleigh Scattering Length Measurement in Liquid Xenon,
 Completion Date: March, 2016

Employment

- 2021-present JSPS Research Fellow (PD)
Department of Physics, Kyoto University
- 2018-2021 JSPS Research Fellow (DC1)
Department of Physics, University of Tokyo
- 2016-2021 Advanced Leading Graduate Course for Photon Science student
Department of Physics, University of Tokyo

Awards

- 2021 Best Student Presentation Award
Physical Society of Japan
- 2015 Academic Excellence Award
Physics and Applied Physics Program, Yokohama National University
- 2015 Physical Engineering Alumni Association Excellence Award
Physics and Applied Physics Program, Yokohama National University
- 2014 Best Poster Award for Investigation Training Program
Physics and Applied Physics Program, Yokohama National University

Grants

- 2021-present Grant-in-Aid for JSPS Research Fellow
Project: *Tests of gravity theories in strong gravity field by search for gravitational-wave polarization modes from compact binary mergers*
- 2018-2021 Grant-in-Aid for JSPS Research Fellow
Project: *Tests of Lorentz invariance of photons using an optical ring cavity*

Teaching

- 2018-2019 Teaching Assistant for Laboratory Class
Department of Physics, University of Tokyo
- 2012-2018 Cram School Teacher for Junior High School Students
Musashi Seminar, Saitama, Japan

Selected memberships

2020 Student Representative, KAGRA Scientific Congress

2018-present Member, LISA Consortium

Papers

1. Hiroki Takeda, Soichiro Morisaki, and Atsushi Nishizawa, "Scalar-tensor mixed polarization search of gravitational waves", (2021). (arXiv:2105.00253)
2. Hiroki Takeda, Soichiro Morisaki, and Atsushi Nishizawa, "Pure polarization test of GW170814 and GW170817 using waveforms consistent with modified theories of gravity", *Physical Review D*, American Physical Society, 103, 064037 (2021). (arXiv:2010.14538)
3. Koji Nagano, Hiroki Takeda, Yuta Michimura, Takashi Uchiyama, and Masaki Ando, "Demonstration of a dual-pass differential Fabry - Perot interferometer for future interferometric space gravitational wave antennas", *Classical and Quantum Gravity*, IOP Publishing, 38, 085018 (2021). (arXiv:2008.12462)
4. Tomotada Akutsu, Fabián Erasmo Peña Arellano, Ayaka Shoda, Yoshinori Fujii, Koki Okutomi, Mark Andrew Barton, Ryutaro Takahashi, Kentaro Komori, Naoki Aritomi, Tomofumi Shimoda, Satoru Takano, Hiroki Takeda, Enzo Nicolas Tapia San Martin, Ryohei Kozu, Bungo Ikenoue, Yoshiyuki Obuchi, Mitsuhiro Fukushima, Yoichi Aso, Yuta Michimura, Osamu Miyakawa, and Masahiro Kamiizumi, "Compact integrated optical sensors and electromagnetic actuators for vibration isolation systems in the gravitational-wave detector KAGRA", *Review of Scientific Instruments*, American Institute of Physics, 91, 115001 (2020). (arXiv:2007.09571)
5. Yuta Michimura, Kentaro Komori, Yutaro Enomoto, Koji Nagano, Atsushi Nishizawa, Eiichi Hirose, Matteo Leonardi, Eleonora Capocasa, Naoki Aritomi, Yuhang Zhao, Raffaele Flaminio, Takafumi Ushiba, Tomohiro Yamada, Li-Wei Wei, Hiroki Takeda, Satoshi Tanioka, Masaki Ando, Kazuhiro Yamamoto, Kazuhiro Hayama, Sadakazu Haino, and Kentaro Somiya "Prospects for improving the sensitivity of the cryogenic gravitational wave detector KAGRA", *Physical Review D*, American Physical Society, 102, 022008 (2020). (arXiv:2006.08970)
6. Tomoya Kinugawa, Hiroki Takeda, and Hiroya Yamaguchi, "Probe for Type Ia supernova progenitor in decihertz gravitational wave astronomy ", (2019). (arXiv:1910.01063)

7. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, "Prospects for gravitational-wave polarization tests from compact binary mergers with future ground-based detectors", *Physical Review D*, American Physical Society, 100, 042001 (2019). (arXiv:1904.09989)
8. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, "Polarization test of gravitational waves from compact binary coalescences", *Physical Review D*, American Physical Society, 98, 022008 (2018). (arXiv:1806.02182)
9. Yuta Michimura, Kentaro Komori, Atsushi Nishizawa, Hiroki Takeda, Koji Nagano, Yutaro Enomoto, Kazuhiro Hayama, Kentaro Somiya, and Masaki Ando, "Particle swarm optimization of the sensitivity of cryogenic gravitational wave detector", *Physical Review D*, American Physical Society, 97, 122003, (2018). (arXiv: 1804.09894)
10. Kentaro Komori, Yutaro Enomoto, Hiroki Takeda, Yuta Michimura, Kentaro Somiya, Masaki Ando, and Stefan W. Ballmer, "Direct Approach for the Fluctuation-Dissipation Theorem under Non-Equilibrium Steady-State Conditions", *Physical Review D*, American Physical Society, 97, 102001 (2018). (arXiv: 1803.00585)
11. Yuta Michimura, Tomofumi Shimoda, Takahiro Miyamoto, Ayaka Shoda, Koki Okutomi, Yoshinori Fujii, Hiroki Tanaka, Mark A. Barton, Ryutaro Takahashi, Yoichi Aso, Tomotada Akutsu, Masaki Ando, Yutaro Enomoto, Raffaele Flaminio, Kazuhiro Hayama, Eiichi Hirose, Yuki Inoue, Takaaki Kajita, Masahiro Kamiizumi, Seiji Kawamura, Keiko Kokeyama, Kentaro Komori, Rahul Kumar, Osamu Miyakawa, Koji Nagano, Masayuki Nakano, Naoko Ohishi, Ching Pin Ooi, Fabián Erasmo Peña Arellano, Yoshio Saito, Katsuhiko Shimode, Kentaro Somiya, Hiroki Takeda, Takayuki Tomaru, Takashi Uchiyama, Takafumi Ushiba, Kazuhiro Yamamoto, Takaaki Yokozawa, and Hirotaka Yuzurihara, "Mirror actuation design for the interferometer control of the KAGRA gravitational wave telescope", *Classical and Quantum Gravity*, IOP Publishing, 34, 225001 (2017). (arXiv: 1709.02574)

Collaboration papers

(LIGO-Virgo-KAGRA, KAGRA, LISA, DECIGO)

1. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Tests of General Relativity with GWTC-3", (2021). (arXiv:2112.06861)
2. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Search of the Early O3 LIGO

Data for Continuous Gravitational Waves from the Cassiopeia A and Vela Jr. Supernova Remnants”, (2021). (arXiv:2111.15116)

3. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”All-sky search for gravitational wave emission from scalar boson clouds around spinning black holes in LIGO O3 data”, (2021). (arXiv:2111.15507)
4. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”Searches for Gravitational Waves from Known Pulsars at Two Harmonics in the Second and Third LIGO-Virgo Observing Runs”, (2021). (arXiv:2111.13106)
5. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”Constraints on the cosmic expansion history from the third LIGO-Virgo-KAGRA Gravitational-Wave Transient Catalog”, (2021). (arXiv:2111.03604)
6. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run”, (2021). (arXiv:2111.03606)
7. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”Search for Gravitational Waves Associated with Gamma-Ray Bursts detected by Fermi and Swift during the O3b LIGO-Virgo Run”, (2021). (arXiv:2111.03608)
8. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”The population of merging compact binaries inferred using gravitational waves through GWTC-3”, (2021). (arXiv:2111.03634)
9. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”All-sky, all-frequency directional search for persistent gravitational waves from Advanced LIGO’s and Advanced Virgo’s first three observing runs ”, Physical Review Letters, American Physical Society, (2021). (arXiv:2110.09834)
10. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, plus D. Jeong and S. Shandera (R. Abbott, ..., Hiroki Takeda, ..., et al.), ”Search for subsolar-mass binaries in the first half of Advanced LIGO and Virgo’s third observing run ”, Physical Review Letters, American Physical Society, (2021). (arXiv:2109.12197)

11. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration plus A. C. Albayati, D. Altamirano, P. Bult, D. Chakrabarty, M. Ng, P. S. Ray, A. Sanna, and T. E. Strohmayer (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Search for continuous gravitational waves from 20 accreting millisecond X-ray pulsars in O3 LIGO data", *Physical Review D*, American Physical Society, (2021). (arXiv:2109.09255)
12. The LIGO Scientific Collaboration, the Virgo Collaboration, and the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "All-sky search for long-duration gravitational-wave transients in the third Advanced LIGO observing run", *Physical Review D*, American Physical Society, (2021). (arXiv:2107.13796)
13. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "All-sky search for short gravitational-wave bursts in the third Advanced LIGO and Advanced Virgo run", *Physical Review D*, American Physical Society, (2021). (arXiv:2107.03701)
14. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "All-sky Search for Continuous Gravitational Waves in the Early O3 LIGO Data", *Physical Review D*, American Physical Society, 104, 082004 (2021). (arXiv:2107.00600)
15. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Observation of Gravitational Waves from Two Neutron Star - Black Hole Coalescences", *The Astrophysical Journal Letters*, IOP Publishing, 915, L5 (2021). (arXiv:2012.12926)
16. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Upper Limits on the Isotropic Gravitational-Wave Background from Advanced LIGO's and Advanced Virgo's Third Observing Run", *Physical Review D*, American Physical Society, 104, 022004 (2021). (arXiv:2101.12130)
17. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Constraints on Cosmic Strings Using Data from the Third Advanced LIGO - Virgo Observing Run", *Physical Review Letters*, American Physical Society, 126, 241102 (2021). (arXiv:2101.12248)
18. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration (R. Abbott, ..., Hiroki Takeda, ..., et al.), "Diving below the Spin-down Limit: Constraints on Gravitational Waves from the Energetic Young Pulsar PSR J0537-6910", *The Astrophysical Journal Letters*, IOP Publishing, 913, L27 (2021). (arXiv:2012.12926)

19. KAGRA Collaboration (T. Akutsu, ..., Hiroki Takeda, ..., et al.), "Overview of KAGRA: Calibration, detector characterization, physical environmental monitors, and the geophysics interferometer ", Progress of Theoretical and Experimental Physics, Physical Society of Japan, ptab018 (2020). (arXiv:2009.09305)
20. KAGRA Collaboration (T. Akutsu, ..., Hiroki Takeda, ..., et al.), "Overview of KAGRA: KAGRA science", Progress of Theoretical and Experimental Physics, Physical Society of Japan, ptaa120 (2020). (arXiv:2008.02921)
21. KAGRA Collaboration (T. Akutsu, ..., Hiroki Takeda, ..., et al.), "Overview of KAGRA: Detector design and construction history ", Progress of Theoretical and Experimental Physics, Physical Society of Japan, ptaa125 (2020). (arXiv:2005.05574)
22. KAGRA Collaboration, LIGO Scientific Collaboration and Virgo Collaboration (B.P. Abbott, ..., Hiroki Takeda, ..., et al.), "Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA", Living Reviews in Relativity, Springer International Publishing, 23, 3 (2020).
23. Kiwamu Izumi, ..., Hiroki Takeda, ..., et al., "The current status of contribution activities in Japan for LISA", Progress of Theoretical and Experimental Physics, Physical Society of Japan, ptaa124 (2020).
24. Enrico Barausse, ..., Hiroki Takeda, ..., et al., "Prospects for fundamental physics with LISA", General Relativity and Gravitation, International Society on General Relativity and Gravitation, 52, 81 (2020). (arXiv:2001.09793)
25. KAGRA Collaboration (T. Akutsu, ..., Hiroki Takeda, ..., et al.), "Application of the independent component analysis to the iKAGRA data", Progress of Theoretical and Experimental Physics, Physical Society of Japan, Volume 2020, Issue 5, 053F01 (2020). (arXiv:1908.03013)
26. KAGRA Collaboration (Tomotada Akutsu, ..., Hiroki Takeda, ..., et al.), "An arm length stabilization system for KAGRA and future gravitational-wave detectors", Classical and Quantum Gravity, IOP Publishing, 37, 035004 (2020). (arXiv:1910.00955)
27. KAGRA Collaboration (Tomotada Akutsu, ..., Hiroki Takeda, ..., et al.), "First cryogenic test operation of underground km-scale gravitational-wave observatory KAGRA", Classical and Quantum Gravity, IOP Publishing, 36, 165008 (2019). (arXiv:1901.03569)
28. KAGRA Collaboration (Y. Akiyama, ..., Hiroki Takeda, ..., et al.), "Vibration isolation system with a compact damping system for power recycling mirrors of

KAGRA ”, Classical and Quantum Gravity, IOP Publishing, 36, 095015 (2019). (arXiv:1901.03053)

29. KAGRA Collaboration (Tomotada Akutsu, ..., Hiroki Takeda, ..., et al.), ”KAGRA: 2.5 Generation Interferometric Gravitational Wave Detector ”, Nature Astronomy, Nature Publishing Group, 3, 35 (2019). (arXiv:1811.08079)
30. KAGRA Collaboration (Tomotada Akutsu, ..., Hiroki Takeda, ..., et al.), ”Construction of KAGRA: an Underground Gravitational Wave Observatory”, Progress of Theoretical and Experimental Physics, Physical Society of Japan, Volume 2018, Issue 1 (2018). (arXiv: 1712.00148)

Talks

International only

1. Hiroki Takeda, Soichiro Morisaki, and Atsushi Nishizawa “Scalar-tensor mixed polarization search for gravitational waves from compact binary coalescences” , Gravitational Wave Physics and Astronomy Workshop 2021, Hannover, Germany, Dec 2021.
2. Hiroki Takeda, Atsushi Nishizawa, and Soichiro Morisaki, ”Polarization tests of GW170814 and GW170817 using waveforms consistent with alternative theories of gravity”, 7th KAGRA International Workshop, In person for Taiwan people, in remote for others, Dec 2020.
3. Hiroki Takeda, Tomoya Kinugawa, and Hiroya Yamaguchi, ”Ability of DECIGO to constrain the Type Ia supernova progenitor system”, Gravitational Wave Physics and Astronomy Workshop 2019, Tokyo, Japan, Oct 2019.
4. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, ”Probing nontensorial polarization of inspiral gravitational waves with the third-generation detectors”, The 28th Workshop on General Relativity and Gravitation in Japan - JGRG28, Tokyo, Japan, Nov 2018.
5. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, ”Polarization test of gravitational waves from compact binary coalescences”, The 15th Marcel Grossmann Meeting, Rome, Italy, July 2018.
6. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, “Parameter estimation with inspiral waveforms of compact binary coalescences including nontensorial gravitational waves polarizations” , 19th KAGRA face-to-face meeting, Osaka, Japan, May 2018.

Posters

International only

1. Hiroki Takeda, Atsushi Nishizawa, and Soichiro Morisaki, “Search for scalar-tensor mixed polarization of gravitational waves” , 14th Edoardo Amaldi Conference on Gravitational Waves, in remote style, July 2021.
2. Hiroki Takeda, Atsushi Nishizawa, Yuta Michimura, Koji Nagano, Kentaro Komori, Masaki Ando, and Kazuhiro Hayama, “Prospects for gravitational-wave polarization test from compact binary coalescences with next-generation detectors” , 26th Face to Face Meeting, in remote style, Dec 2020.
3. Hiroki Takeda, Atsushi Nishizawa, and Soichiro Morisaki, “Tests of alternative theories of gravity through gravitational-wave polarization modes” , 22nd International Conference on General Relativity and Gravitation, 13th Edoardo Amaldi Conference on Gravitational Waves, Valencia, Spain, July 2019.