Personal Information

Adrian Ka-Wai Chung
Date of birth: 1st October 1995
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Education

- 2019-2022 (degree conferred on 1st January 2023)
  Doctor of Philosophy in Physics
  Theoretical Particle Physics and Cosmology Group, Department of Physics, King's College London
  Supervisor: Prof. Mairi Sakellariadou
- 2017-2019 (degree conferred in 2020)
  Master of Philosophy in Physics
  Department of Physics, The Chinese University of Hong Kong
  Supervisor: Prof. Tjonnie G.F. Li
- 2013-2017
  Bachelor of Science (Physics), First Class Honours
  Department of Physics, The Chinese University of Hong Kong
  Supervisor: Prof. Tjonnie G.F. Li

Academic positions

- Oct 2025 -
  Herchel Smith Fellow in the Department of Applied Mathematics and Theoretical Physics (DAMTP), the University of Cambridge
- 2022 - Sep 2025
  Postdoctoral research associate in Prof Nicolás Yunes' group at University of Illinois Urbana-Champaign (UIUC)
- June 2015 - August 2015
  Summer research exchange student in Prof. Gregory Tucker's group at Brown University, specializing in analyzing data collected by the Spitzer telescope for exoplanet search.

Collaborations and professional memberships

- 2024 - Sep 2025
  Member of the National Science Foundation - Simons Artificial Intelligence Institute for the Sky (SkAI)
- 2022 - Sep 2025
  Member of the Laser Interferometer Space Antenna (LISA) consortium
- 2022 - Sep 2025
  Member of the Illinois Center for Advanced Studies of the Universe (ICASU)
- 2022 - 2025
  Member of the American Physical Society (APS)
- 2016 - 2022
  Member of the Laser Interferometer Gravitational-wave Observatory (LIGO) Scientific Collaboration. I was an active member of the Testing General Relativity (TGR) working group. I led a collaboration-wide TGR analysis whose results are included in several LIGO-Virgo-KAGRA collaboration publications (see publications below).

Awards, honours and research grants

Through my research career, I have secured a total of ~ 600k USD of funds, including scholarships, computation grants[1], and awards.

1. Herchel Smith Fellowship, the University of Cambridge, 2025 -
2. Computational grant, "PHY240142: Simulating black-hole pulsations in modified gravity", the National Science Foundation (NSF) through the Office of Advanced Cyberinfrastructure (ACCESS), PI, 400k USD, 2024
3. Hong Kong Scholarship for Excellence Scheme ($>$ 1 million HKD $>$ 130k euro ~ 150k USD in total), by the HKSAR Government, 2019 - 2022
4. Best student presentation prize in the quantum gravity parallel session at the 30th Texas Symposium on Relativistic Astrophysics, 2019
5. Teaching-Assistant Award, by the Department of Physics of the Chinese University of Hong Kong, 2018 and 2019
6. Reaching Out Award (10 k HKD), by the HKSAR Government, 2018
7. CN Yang Scholarship (≤ 10 k HKD), by Prof. Chen-Ning Yang and the Department of Physics of the Chinese University of Hong Kong, 2014, 2015 and 2017
8. Professor and Mrs Yau Wa Chan Scholarship (10k HKD), by the Department of Physics of the Chinese University of Hong Kong, 2016
9. Dean Honour List, by the Faculty of Science of the Chinese University of Hong Kong, 2014, 2015 and 2016
10. Department/Programme Scholarship (5k HKD per award), by the Shaw College of the Chinese University of Hong Kong, 2014, 2015 and 2016
11. College Head List, by the Shaw College of the Chinese University of Hong Kong, 2014, 2015 and 2016
12. Talent Development Scholarship (10k HKD), by the HKSAR Government, 2015

Referee service

I was a referee of the following journals:

- Physical Review Letters
- Physical Review D
- The European Physical Journal C
- Classical and Quantum Gravity
- International Journal of Modern Physics D

Selected publications

Short-author-list publications

1. **A.K.-W.Chung**, and Nicolás Yunes, Quasi-normal mode frequencies and gravitational perturbations of black holes with any subextremal spin in modified gravity through METRICS: the dynamical Chern-Simons gravity case, arXiv: 2503.11759
2. Bryce Cousins, Kristen Schumacher, **A.K.-W.Chung**, Thomas Callister, Colm Talbot, Daniel E. Holz, and Nicolás Yunes, The Stochastic Siren: Astrophysical Gravitational-Wave Background Measurements of the Hubble Constant, arXiv: 2503.01997
3. Yiqi Xie, **A.K.-W.Chung**, Thomas Sotiriou, and Nicolás Yunes, Bayesian search for massive scalar charge from LIGO-Virgo-KAGRA binaries, arXiv:2410.14801, under review by *Phys. Rev. Lett.*
4. **A.K.-W.Chung**, and Nicolás Yunes, Quasi-normal mode frequencies and gravitational perturbations of black holes with any subextremal spin in modified gravity through METRICS: the scalar-Gauss-Bonnet gravity case, *Phys. Rev. D* 110, 064019, 2024

[1] A computational grant is a grant that can only be used to purchase computational core hours.

5. **A.K.-W.Chung**, and Nicolás Yunes, Ringing out General Relativity: Quasi-normal mode frequencies for black holes of any spin in modified gravity, *Phys. Rev. Lett.* 133, 181401 (2024)
6. **A.K.-W.Chung**, Pratik Wagle, and Nicolás Yunes, Spectral method for the gravitational perturbations of black holes: Kerr background case, *Phys. Rev. D* 109, 044072 (2024)
7. **A.K.-W.Chung** and Nicolás Yunes, Untargeted Bayesian search of anisotropic gravitational-wave backgrounds through the analytical marginalization of the posterior, *Phys. Rev. D* 108, 043032 (2023).
8. **A.K.-W.Chung**, Pratik Wagle, and Nicolás Yunes, Spectral method for the gravitational perturbations of black holes: Schwarzschild background case, *Phys. Rev. D* 107, 124032 (2023).
9. **A.K.-W.Chung**, Alexander C. Jenkins, Joseph D. Romano, Mairi Sakellariadou, Targeted search for the kinematic dipole of the gravitational-wave background, *Phys. Rev. D* 106, 082005 (2022).
10. **A.K.-W.Chung**, Joseph Gais, Mark Ho-Yeuk Cheung and Tjonnie Guang Feng Li, Searching for ultralight bosons with supermassive black hole ringdown, *Phys. Rev. D* 104, 084028 (2021).
11. **A.K.-W.Chung** and Tjonnie Guang Feng Li, Lensing of gravitational waves as a novel probe of graviton mass, *Phys. Rev. D* 104, 124060 (2021)
12. **A.K.-W.Chung** and Sakellariadou, M., Upper limits on the temperature of inspiraling astrophysical black holes. *The European Physical Journal C* 81, 592 (2021).
13. Mark Ho-Yeuk Cheung, Levi Wing-Hei Poon, **A.K.-W.Chung** and Tjonnie Guang Feng Li, Ringdown spectroscopy of rotating black holes pierced by cosmic strings, *Journal of Cosmology and Astroparticle Physics* 02(2021)040.
14. **A.K.-W.Chung** and Tjonnie Guang Feng Li, Phenomenological inclusion of alternative dispersion relations to the Teukolsky equation and its application to bounding the graviton mass with gravitational-wave measurements, *Phys. Rev. D* 99, 124023 (2019).

LIGO-Virgo-Collaboration publications with significant contributions

When I was a member of the LIGO Scientific Collaboration (LSC), I made significant contributions to the following LSC publications.

1. Abbott, B. P. *et al.* (The LIGO Scientific Collaboration and the Virgo Collaboration), Tests of General Relativity with Binary Black Holes from the second LIGO-Virgo Gravitational-Wave Transient Catalog, *Phys. Rev. D* 103, 122002 (2021).
2. Abbott, B. P. *et al.* (The LIGO Scientific Collaboration and the Virgo Collaboration), Tests of general relativity with the binary black hole signals from the LIGO-Virgo catalog GWTC-1, *Phys. Rev. D* 100, 104036 (2019).

Review article

1. Emanuele Berti *et. al*, Black Hole Spectroscopy: A Review, *in prep., expected to be finished in July 2025*

Popular science articles

1. **A.K.-W.Chung**, Ringdown: the music by oscillating black holes, invited article contribution to the Hong Kong Laureate Newsletter, https://hklaureateforum.org/en/ringdown-the-music-by-oscillating-black-holes, October 2023.

Invited and contributed talks, seminars, and participation in conferences, workshops, and symposia

1. (To give) *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the University of Virginia, Charlottesville United States of America, 28th April 2025
2. *Computations of black-hole quasinormal modes in dynamical Chern-Simons gravity using METRICS*, contributed talk, American Physical Society April Meeting, California United States of America, 19th March 2025

3. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the Chinese University of Hong Kong, Hong Kong China, 24th January 2025
4. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the University of Hong Kong, Hong Kong China, 22nd January 2025
5. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the City University of Hong Kong, Hong Kong China, 21st January 2025
6. *Gravitational-wave tests of general relativity with METRICS*, contributed talk, 2025 IAS Program on Fundamental Physics, the Institute of Advanced Studies, Hong Kong China, 15th January 2025
7. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the Chinese University of Hong Kong, Hong Kong China, 24th January 2025
8. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the University of Hong Kong, Hong Kong China, 22nd January 2025
9. *Gravitational-wave tests of general relativity with METRICS*, **invited** seminar, the City University of Hong Kong, Hong Kong China, 21st January 2025
10. *Gravitational-wave tests of general relativity with METRICS*, contributed talk, 2025 IAS Program on Fundamental Physics, the Institute of Advanced Studies, Hong Kong China, 15th January 2025
11. Invited visitor to Prof. Yanbei Chen's group, Theoretical Astrophysics Including Relativity and Cosmology (TAPIR), California Institute of Technology, California United States of America, 11^{th} - 16^{th} November, 2024
12. *METRICS and its applications to extract physics through gravitational-wave detection*, **invited** seminar, Perimeter Institute, Waterloo Canada, 31st October 2024
13. *METRICS and its applications to extract physics through gravitational-wave detection*, **invited** seminar, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam Germany, 13th September 2024
14. *METRICS and its applications to extract physics through gravitational-wave detection*, **invited** seminar, KU Leuven, Leuven Belgium, 6th September 2024
15. Black Hole Inside and Out, **invited** participant, Niels Bohr Institute, Copenhagen Denmark, 26th - 31st August 2024
16. Ringdown Inside and Out, **invited** participant, Niels Bohr Institute, Copenhagen Denmark, 22nd - 24th August 2024
17. *METRICS and its applications to extract physics through gravitational-wave detection*, **invited** seminar, Niels Bohr Institute, Copenhagen Denmark, 20th August 2024
18. *Extracting fundamental physics through the detection of the ringdown phase by LISA*, contributed talk, The 15th International Laser Interferometer Space Antenna (LISA) Symposium, Dublin Ireland, 10th July 2024
19. *Black-hole ringdown phase in modified gravity using METRICS*, contributed talk, American Physical Society April Meeting, California United States of America, 4th April 2024
20. Chair of the session "Tests of General Relativity", American Physical Society April Meeting, California United States of America, 3rd April 2024
21. *Rotating black-hole METRICS*, **invited** seminar, the Chinese University of Hong Kong, Hong Kong China, 26th February 2024
22. *Rotating black-hole METRICS*, contributed talk, YITP long-term workshop Gravity and Cosmology 2024, Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto Japan, 24th February, 2024
23. *Spectral method for computing gravitational quasinormal-mode frequencies of black hole*, **invited** seminar, Theoretical Astrophysics Including Relativity and Cosmology (TAPIR), California Institute of Technology, California United States of America, 18th October 2023
24. *Spectral method for computing gravitational quasinormal-mode frequencies of black hole*, contributed presentation, Amaldi15 Premier International Conference on Gravitational Waves (online), 17th July 2023
25. *Untargeted Bayesian search of anisotropic gravitational-wave backgrounds through the analytical marginalization of the posterior*, **invited** presentation at the call of the anisotropic gravitational-wave background working group of LIGO, 22nd May 2023

26. *Spectral method for computing gravitational quasinormal-mode frequencies of black hole*, contributed presentation, American Physical Society April Meeting, Minnesota United States of America, 15th April 2023
27. *Spectral method for computing gravitational quasinormal-mode frequencies of black hole*, **invited** seminar, the Department of Physics, University of Wisconsin-Milwaukee, Wisconsin United States of America, 3rd February, 2023
28. *Searching for ultralight bosons with supermassive black hole ringdown*, **invited** seminar, the Department of Applied Mathematics and Theoretical Physics, Cambridge University, Cambridge United Kingdom, 13th July, 2022
29. *Searching for ultralight bosons with supermassive black hole ringdown*, (online) contributed talk, Workshop on Very Light Dark Matter 2021, 28th September 2021
30. *Searching for ultralight bosons with supermassive black hole ringdown*, (online) contributed talk, Gravitex 2021: International Conference on Gravitation, 9th August 2021
31. *Probing the purely ingoing nature of the black-hole event horizon*, contributed talk, the 30th Texas Symposium on Relativistic Astrophysics, The University of Portsmouth, Portsmouth United Kingdom
32. *Probing the purely ingoing nature of the black-hole event horizon*, contributed talk, Gravitational Wave Physics and Astronomy Workshop, The University of Tokyo, Tokyo Japan, 16th October 2019
33. *A phenomenological inclusion of alternative dispersion relations to the Teukolsky equation and its application to bounding the graviton mass with gravitational-wave measurements*, contributed talk, Testing Gravity 2019, Simon Fraser University, Vancouver Canada, 24th January 2019
34. *Testing General Relativity Through Gravitational-Wave Detection*, **invited** talk, 2019 TGWG workshop on gravitational wave data analysis, Taiwan China, 21st January 2019
35. *Constraining graviton mass with black-hole ringdown*, **invited** seminar, the University of Pisa, Pisa Italy, August 2018
36. Updating the LIGO-Virgo Collaboration on the residual analysis, LIGO-Virgo Collaboration Meeting, August 2018
37. *Constraining graviton mass with black-hole ringdown*, **invited** seminar, the Dutch National Institute for Subatomic Physics (Nikhef), Amsterdam Netherlands, August 2018
38. *Constraining Lorentz violation of gravitational waves with lensing*, Seminar in Workshop "Gravity and Cosmology 2018", Yukawa Institute of Theoretical Physics, Kyoto University, Kyoto Japan, 6th February 2018
39. Summer School of Gravitational Waves, invited participant, The International Centre for Theoretical Sciences (ICTS) of the Tata Institute of Fundamental Research, Bengalore India, 2016

Student mentoring

Since my graduate studies at CUHK, I supervised or mentored the following students on various projects.

1. Bryce Cousins, on improving the measurement accuracy of the Hubble constant by combining the measurement of the binary black-hole population and gravitational-wave background. Bryce is now a 2nd year PhD student at UIUC and a National Science Foundation (NSF) graduate research fellow, 2024 - 2025
2. Kristen Schumacher, on improving the measurement accuracy of the Hubble constant by combining the measurement of the binary black-hole population and gravitational-wave background. Kristen is now a 6th year PhD student at UIUC and National Science Foundation (NSF) graduate research fellow, 2024 - 2025
3. Mark Ho-Yeuk Cheung, on ringdown spectroscopy of rotating black holes pierced by cosmic strings, 2019, who is now a PhD student in physics at Johns Hopkins University, and a Croucher scholar in 2022.
4. Levi Wing-Hei Poon, on ringdown spectroscopy of rotating black holes pierced by cosmic strings, 2019, who is now a PhD student in mathematics at the University of Illinois Urbana-Champaign, and a Croucher scholar in 2021.
5. Alan Tsz-Lok Lam, on numerical simulation of spherically symmetric core-collapse supernovae in Gauss-Bonnet theories, 2018, who is now a PhD student in physics at the Max Planck Institute for Gravitational Physics.

6. Alexander M. Tanaka, on modification of the Teukolsky equation to include the generic dispersion of gravitational waves, 2018, who is now a PhD student in Biophysics at the University of Oxford.
7. Jacky Hoi-Tung Yip, on developing a numerical code to compute quasinormal mode frequencies of black holes in massive gravitational theories, 2018, who is now a PhD student at the University of Wisconsin-Madison.