Otto Akseli Hannuksela

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BIOGRAPHY

I am an Assistant Professor at CUHK, Hong Kong, and a senior member of the LIGO Scientific Collaboration. Besides my primary work in detecting, analyzing, and building models for gravitational waves as a part of the LSC and KSC, I have an interest in applying gravitational waves to different branches of Physics, including the dark matter problem, modified gravity, beyond-standard-model physics, cosmology, and gravitational lensing. I have been an LVK member since 2016.

EDUCATION

PhD *(Physics)*
AUG 2017 - AUG 2019, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

- Thesis topic: Gravitational waves
- Postgraduate Research Output Award 2019

MPhil *(Physics; Research Degree)*
AUG 2015 - SEP 2017, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

BSc *(Physics)*
SEP 2011 - FEB 2015, UNIVERSITY OF HELSINKI (FINLAND)

EMPLOYMENT

Assistant Professor
JUL 2023 - CURRENT, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

Research Assistant Professor
SEP 2021 - JUN 2023, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

- Co-chair, LVK lensing sub-group
- Supervision: H. Phurailatpam (PhD), A. Liu (PhD), J. Poon (PhD), Amit-Jit Singh (MPhil), E. Seo (MPhil), K. Chan (BSc), D. Cheung (BSc), W.L. Chan (BSc), J. Kwok (BSc)
- Teaching/mentoring: J. Janquart (PhD), N. Harsh (PhD), Mesut Caliskan (BSc)

Postdoctoral Researcher
SEP 2019 - AUG 2021, NIKHEF/UTRECHT UNIVERSITY (THE NETHERLANDS)

- Chair, LVK lensing sub-group under testing general relativity
- Manager & chair, LVC O3a lensing paper
- Teaching/mentoring: Justin Janquart (PhD), Renske Wierda (BSc), Mesut Caliskan (BSc)

Research Assistant
MAY 2013 - AUG 2015, FINNISH METEOROLOGICAL INSTITUTE (FINLAND)

GRANTS

Gravitational-wave microlensing with strong lensing (GRF 117,000 USD**)**
JAN 2025 - DEC 2028

Connecting cosmological simulations with multimessenger gravitational lensing (SSFCRS 64300 USD**; co-I)**
JAN 2025 - DEC 2027

Gravitational-wave strong lensing follow-up applications (GRF 149,000 USD**)**
JAN 2024 - DEC 2027

Start-up fund (230,000 USD**)**
2023 - DEC 2027

Towards the first observations of gravitational-wave lensing (GRF 112,000 USD**)**
JAN 2023 - DEC 2026

Probing subhalos with gravitational-wave millilensing (Direct Grant 19,000 USD**)**
JUN 2022 - JUN 2023

MEMBERSHIPS AND RESPONSIBILITIES

2023 - current	PI, CUHK LIGO group (LIGO)
2022 - current	PI, CUHK KAGRA group (KAGRA)
2022 - current	KAGRA Scientific Congress Member (KAGRA)
2021 - current	Senior Council Member, LIGO Collaboration
2021 - current	Member, LIGO Collaboration
2022 - 2025	Co-Chair, LVK lensing sub-group
2019 - 2022	Chair, LVK lensing sub-group (under Testing General Relativity analysis group)
2019 - 2021	Member, Virgo Collaboration
2020 - 2021	Manager and chair, O3a LVC lensing paper
2016 - 2019	Member, LIGO Scientific Collaboration

FEATURED PUBLICATIONS

- **Hannuksela, Otto A.,** et al. *"Localizing merging black holes with sub-arcsecond precision using gravitational-wave lensing"*, **MNRAS (2020).**
- **Hannuksela, Otto A.,** et al. *"Extreme Dark Matter Tests with Extreme Mass Ratio Inspirals"*, **PHYS. REV. D (2020).**
- **Hannuksela, Otto A.**, et al. "*Probing the existence of ultralight bosons with a single gravitational-wave measurement*", ***NATURE ASTRONOMY LETTERS (2019)***.
- **Hannuksela, Otto A.**, et al. *"Search for gravitational lensing signatures in LIGO-Virgo binary black hole events"*, **ASTROPHYSICAL JOURNAL LETTERS (2019).**
- ***All publications [inspire]***

FELLOWSHIPS/AWARDS

2022 IOP Publishing Top Cited Paper Award
2019 CIERA Postdoc Fellowship, Northwestern University (declined)
2019 Postgraduate Research Output Award
AUG 2017 - SEP 2019 Hong Kong PhD Fellowship

REVIEW

Reviewer for:

- Astrophysical Journal Letters
- European Physical Journal C
- Physical Review D
- Physical Review Letters
- Monthly Notices of the Royal Astronomical Society
- Nature Astronomy
- Astroparticle Physics

References available upon request

ATTACHMENTS:
BIBLIOGRAPHY OF PUBLICATIONS

2025

1. JSC Poon, S Rinaldi, J Janquart, H Narola, **OA Hannuksela**. *Galaxy lens reconstruction based on strongly lensed gravitational waves: similarity transformation degeneracy and mass-sheet degeneracy.* **MNRAS (2025)**
2. J Janquart, D Keitel, RKL Lo, JCL Chan, JM Ezquiaga, OA Hannuksela, AKY Li, A More, H Phurailatpam, N Singh, LE Uronen, M Wright, N Adhikari, S Biscoveanu, T Bulik, AM Farah, A Herrernan, P Joshi, V Juste, A Kedia, SA Nivhols, G Praten, C Rawcliffe, S Roy, EM Sänger, H Tong, M Trevor, L Vujeva, M Zevin. *What is the nature of GW230529? An exploration of the gravitational lensing hypothesis.* **MNRAS (2025)**
3. SHW Leong, J Janquart, AK Sharma, P Martens, PA Ajith, **OA Hannuksela**. *Constraining binary mergers in AGN disks using the non-observation of lensed gravitational waves*. **ApJL (2025)**
4. E Seo, X SHan, J Janquart, OA Hannuksela, MA Hendry, B Hu. *Residual test to search for microlensing signatures in strongly lensed gravitational wave signals*. ArXiv:2503.02186

2024

5. SMC Yeung, MHY Cheung, M Zumalacarregui, OA Hannuksela. wolensing: A Python package for computing the amplification factor for gravitational waves with wave-optics effects. ArXiv:2410.19804
6. TCK Ng, S Rinaldi, OA Hannuksela. *Inferring cosmology from gravitational waves using non-parametric detector-frame mass distribution.* ArXiv:2410.23541
7. A Liu, RS Chandramouli, OA Hannuksela, N Yunes, TGF Li. Millilensing induced systematic biases in parameterized tests of General Relativity. ArXiv:2410.21738
8. H Phurailatpam, OA Hannuksela. gwsnr: A python package for efficient signal-to-noise calculation of gravitational-waves. ArXiv:2412.09888
9. H Phurailatpam, A More, H Narola, LCY Ng, J Janquart, C Van Den Broeck, **OA Hannuksela**, N Singh, D Keitel. *ler : LVK (LIGO-Virgo-KAGRA collaboration) event (compact-binary mergers) rate calculator and simulator.* ArXiv:2407.07526
10. LE Uronen, TL Li, J Janquart, HP Phurailatpam, JSC Poon, EW Wempe, LVE Koopmans, **OA Hannuksela**. *Finding Black Holes: an Unconventional Multi-messenger.* ArXiv:2406.14257
11. S Rinaldi, G Demasi, W Del Pozzo, **OA Hannuksela**. *Hierarchical inference of evidence using posterior samples*. ArXiv:2405.07504
12. LCY Ng, J Janquart, H Phurailatpam, H Narola, JSC Poon, C Van Den Broeck, **OA Hannuksela**. *Uncovering faint lensed gravitational-wave signals and reprioritizing their follow-up analysis using galaxy lensing forecasts with detected counterparts*. ArXiv:2403.16532
13. H Narola, J Janquart, L Haegel, K Haris, **OA Hannuksela**, C Van Den Broeck. *How well can modified gravitational wave propagation be constrained with strong lensing?* **Physical Review D (2024)**
14. EW Wempe, LVE Koopmans, ARAC Wierda, **OA Hannuksela**, C Van Den Broeck. *On the detection and precise localization of merging black holes events through strong gravitational lensing*. **MNRAS (2024)**
15. KHM Chan, **OA Hannuksela**. Extracting ultralight boson properties from boson clouds around postmerger remnants. **Physical Review D (2024)**

2023

16. IA Gupta, C Afle, KG Arun, A Bandopadhyay, M Baryakhtar, S Biscoveanu, S Borhanian, F Broekgaarden, A Corsi, A Dhani, M Evans, ED Hall, **OA Hannuksela**, K Kacanja, R Kashyap, S Khadkikar, K Kuns, TGF Li, AL Miller, AH Nitz, BJ Owen, C Palomba, A Pearce, H Phurailatpam, B Rajbhandari, J Read, JD Romano, BS Sathyaprakash, DH Shoemaker, D Singh, S Vitale, L Barsotti, E Berti, C Cahillane, HY Chen, P Fritschel, CJ Haster, P Landry, G Lovelace, D McClelland, BJJ Slagmolen, J Smith, MS Santos, L Sun, D Tanner, H Yamamoto, M Zucker. *Characterizing Gravitational Wave Detector Networks: From A## to Cosmic Explorer*. ArXiv:2307.10421
17. M Evans, A Corsi, C Afle, A Ananyeva, KG Arun, S Ballmer, A Bandopadhyay, L Barsotti, M Baryakhtar, E Berger, E Berti, S Biscoveanu, S Borhanian, F Broekgaarden, DA Brown, C Cahillane, L Campbell, HY Chen, KJ Daniel, A Dhani, JC Driggers, A Effler, R Eisenstein, S Fairhurst, J Feicht, P Fritschel, P Fulda, IA Gupta, ED Hall, G Hammond, **OA Hannuksela**, H Hansen, CJ Haster, K Kacanja, B Kamai, R Kashyap, JS Key, S Khadkikar, A Kontos, K Kuns, M Landry, P Landry, B Lantz, TGF Li, G Lovelace, V Mandic, GL Mansell, D Martynov, L McCuller, AL Miller, AH Nitz, BJ Owen, C Palomba, J Read, H Phurailatpam, S Reddy, J Richardson, J Rollins, JD Romano, BS Sathyaprakash, R Schofield, DH Shoemaker, D Sigg, D Singh, B Slagmolen, P Sledge, J Smith, MS Santos, A Strunk, L Sun, D Tanner, LAC van Son, S Vitale, B Willke, H Yamamoto, M Zucker. *Cosmic Explorer: A Submission to the NSF MPSAC ngGW Subcommittee*. ArXiv:2306.13745
18. Janquart J, Wright M, Goyal S, Chan JCL, Ganguly A, Garrón Á, Keitel D, Li AKY, Liu A, Lo RKL, Mishra A, More A, Phurailatpam H, Pankunni P, Biscoveanu S, Cremonese P, Cudell JR, Ezquiaga JM, Garcia-Bellido J, **Hannuksela OA**, Haris K, Harry I, Hendry M, Husa S, Kapadia S, Li TGF, Hernandez IM, Mukherjee S, Seo E, Van Den Broeck C, Veitch J. *Follow-up analyses to the O3 LIGO-Virgo-KAGRA lensing searches.* **MNRAS (2023)**
19. Janquart J, Haris K, **Hannuksela OA**, Van Den Broeck C. *The Return of GOLUM: Improving Distributed Joint Parameter Estimation for Strongly-Lensed Gravitational Waves.* **MNRAS (2023)**
20. Liu A, Wong ICR, Leong SHW, More A, **Hannuksela OA**, Li TGF. Exploring the hidden Universe: A novel phenomenological approach for recovering arbitrary gravitational-wave millilensing configurations **MNRAS (2023)**
21. LIGO-Virgo-Kagra Collaboration. *Search for gravitational-lensing signatures in the full third observing run of the LIGO-Virgo network.* ArXiv:2304.08393
22. Wu, ZF, Chan WL, Hendry M, **Hannuksela OA**. Reducing the Impact of Weak-lensing Errors on Gravitational-wave Standard Sirens. **MNRAS (2023)**
23. Yeung SMC, Cheung MHY, Gais JAJ, **Hannuksela OA**, Li TGF. *Detectability of microlensed gravitational waves.* **MNRAS (2023)**

2022

24. Çalışkan M, Ezquiaga JM, **Hannuksela O**, Holz DE. *Lensing or luck? False alarm probabilities for gravitational lensing of gravitational*

waves. **Physical Review D (2023)**

25. Kim K, Lee J, **Hannuksela OA**, Li TGF. *Deep Learning–based Search for Microlensing Signature from Binary Black Hole Events in GWTC-1 and -2*. **Astrophysical Journal (2022)**
26. Seo E, **Hannuksela OA**, Li TGF. *Improving Detection of Gravitational-wave Microlensing Using Repeated Signals Induced by Strong Lensing.* **Astrophysical Journal (2022)**
27. Cheung DHT, Wong KWK, **Hannuksela OA**, TGF Li, Ho S. *Testing the robustness of simulation-based gravitational-wave population inference.* **Physical Review D (2022)**

2021

28. Kim K, Lee J, Yuen RSH., **Hannuksela OA**, Li TGF. *Identification of Lensed Gravitational Waves with Deep Learning*. **Astrophys.Journal (2021)**.
29. The LIGO Scientific Collaboration, the Virgo Collaboration. *Tests of General Relativity with Binary Black Holes from the second LIGO-Virgo Gravitational-Wave Transient Catalog.* **Physical Review D (2021)**.
30. Janquart J, Seo E, **Hannuksela OA**, Li TGF, Van Den Broeck C. *On the identification of individual gravitational wave image types of a lensed system using higher-order modes.* **Astrophysical Journal Letters (2021).**
31. The LIGO Scientific Collaboration, the Virgo Collaboration. *Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run.* **Astrophysical Journal (2021).**
    - Editorial team lead
    - Analysis lead for the high-mass event section
    - Reviewer for the lensing statistics and
32. Wierda ARAC, Wempe E, **Hannuksela OA,** Koopmans LVE, Van Den Broeck C. *Beyond the detector horizon: Forecasting gravitational-wave strong lensing.* **Astrophysical Journal (2021)**
33. Janquart J, **Hannuksela OA**, Haris K, Van Den Broeck C. A fast and precise methodology to search for and analyse strongly lensed gravitational-wave events. **Monthly Notices of the Royal Astronomical Society 506.4: 5430–5438 (2021)**
34. Ng KKY, **Hannuksela OA**, Vitale S,Li TGFL. *Searching for ultralight bosons within spin measurements of a population of binary black hole mergers.* **Phys. Rev. D 103, 063010 (2021)**.
35. Ng KKY, Vitale S, **Hannuksela OA**, Li TGFL. *Constraints on ultralight scalar bosons within black hole spin measurements from LIGO-Virgo's GWTC-2*. **Physical Review Letters 126.15 (2021)**.
36. The LIGO Scientific Collaboration, The Virgo Collaboration. *Observation of Gravitational Waves from Two Neutron Star–Black Hole Coalescences.* **Astrophysical Journal Letters (2021)**.
37. Cheung MHY, Gais J, **Hannuksela OA**, Li TGF. *Stellar-mass microlensing of gravitational waves.* **Monthly Notices of the Royal Astronomical Society 503.3: 3326-3336 (2021)**.

2020

38. The LIGO Scientific Collaboration, the Virgo Collaboration. *Properties and astrophysical implications of the 150 Msun binary black hole merger GW190521*. **Astrophysical Journal Letters (2020)**.
39. **Hannuksela OA**, Ng CYK, Li TGFL. *Extreme Dark Matter Tests with Extreme Mass Ratio Inspirals.* **Phys. Rev. D 102, 103022 (2020)**
40. Pagano G, **Hannuksela OA**, Li TGF. *lensingGW: a Python package for lensing of gravitational waves*. **Astronomy & Astrophysics (2020)**
41. **Hannuksela OA**, Collett TE, Çalışkan M, Li TGF. *Localizing merging black holes with sub-arcsecond precision using gravitational-wave lensing.* **Monthly Notices of the Royal Astronomical Society 498.3: 3395-3402 (2020)**
42. Pang PTH, **Hannuksela OA**, Dietrich T, Pagano G, Harry IW. *Lensed or not lensed: Determining lensing magnifications for binary neutron star mergers from a single detection.* **Monthly Notices of the Royal Astronomical Society (2020)**
43. The LIGO Scientific Collaboration, the Virgo Collaboration. *GW190425: Observation of a Compact Binary Coalescence with Total Mass ~3.4M⊙*. **Astrophysical Journal Letters (2020)**.

2019

44. **Hannuksela OA**, Wong KWK, Brito R, Berti E, Li TG. *Probing the existence of ultralight bosons with a single gravitational-wave measurement.* **Nature Astronomy Letters (2019)**
45. Hannuksela OA, Haris K, Ng KKY, Kumar S, Mehta AK, Keitel D, Li TGFL, Ajith P. *Search for gravitational lensing signatures in LIGO-Virgo binary black hole events*. **Astrophysical Journal Letters (2019)**
    - Featured in the top 1% most cited papers in the Astronomy and Astrophysical
    - Won the IOP Publishing Top Cited Paper Award
46. Diego JM, **Hannuksela OA**, Kelly PL, Pagano G, Broadhurst T, Kim K, Li TGF, Smoot GF. *Observational signatures of microlensing in gravitational waves at LIGO/Virgo frequencies.* **Astronomy & Astrophysics (2019)**

2018

47. Carullo G, van der Schaaf L, London L, Pang PT, Tsang KW, **Hannuksela OA,** Meidam J, Agathos M, Samajdar A, Ghosh A, Li TGFL. *On the empirical verification of the black hole no-hair conjecture from gravitational-wave observations.* **Phys. Rev. D 98, 104020 (2018)**
48. Lai KH, **Hannuksela OA,** Herrera-Martín A, Diego JM, Broadhurst T, Li TGFL. *Discovering intermediate-mass black hole lenses through gravitational wave lensing.* **Phys. Rev. D 98, 083005 (2018)**
    - (sole corresponding author)

2016

49. Hoilijoki S, Palmroth M, Walsh BM, Pfau‐Kempf Y, von Alfthan S, Ganse U, **Hannuksela OA,** Vainio R. *Mirror modes in the Earth's magnetosheath: Results from a global hybrid‐Vlasov simulation.* **Journal of Geophysical Research: Space Physics 121.5: 4191-4204 (2016)**

2015

50. Palmroth M, Archer M, Vainio R, Hietala H, Pfau‐Kempf Y, Hoilijoki S, **Hannuksela OA**, Ganse U, Sandroos A, Alfthan SV, Eastwood JP. *ULF foreshock under radial IMF: THEMIS observations and global kinetic simulation Vlasiator results compared.* **Journal of Geophysical Research: Space Physics 120.10 (2015): 8782-8798 (2015)**
51. Kempf Y, Pokhotelov D, Gutynska O, Wilson III LB, Walsh BM, von Alfthan S, **Hannuksela OA**, Sibeck DG, Palmroth M. *Ion distributions in the Earth's foreshock: Hybrid‐Vlasov simulation and THEMIS observations.* **Journal of Geophysical Research: Space Physics 120.5 (2015): 3684-3701 (2015)**

2014

52. Kempf Y, Pokhotelov D, von Alfthan S, **Hannuksela OA**, Palmroth M. *Hybrid-Vlasov simulations of the Earth's collisionless bow shock and foreshock region*. **General Assembly and Scientific Symposium (URSI GASS), 2014 XXXIth URSI 2014 Aug 16 (pp. 1-1). IEEE (2014)**
    - Conference publication

TEACHING

SUMMARY

CUHK (2021 - current): I currently co-supervise Kailib Doney (PhD), Laura Uronen (PhD), Jason Poon (PhD), Hemantakumar Phurailatpam (PhD), Anna Liu (PhD), Samson Leong (PhD), Brian Cheng (MPhil), Thomas Ng (MPhil), Charmaine Wong (MPhil), Elwin Li (MPhil). They work on projects related to binary black hole formation channels, gravitational-wave lensing, statistical modeling of binary populations, waveform modelling, alternative theories of gravity, and data analysis. Beyond the graduate student supervision, I also currently work with several undergraduate students, including LeoNg, Ben On, Timothy Chan, Thomas Ng, Aidan Chong, and Zhaofeng Wu, on topics relating to gravitational-wave wave Doppler effects, sub-threshold search pipelines, and modeling weak lensing biases on cosmological measurements. Beyond current CUHK students, I also actively work with CUHK alumni and students from my postdoc institute, including Damon Cheung, who is now a graduate student at Michigan and collaborates with graduate students from Italy on modeling systematic biases in strong lensing, Kelvin Chan, who is at the McGill University and works on detecting continuous waves from ultralight boson clouds, Justin Janquart, who works on gravitational-wave lensing and leads a group-wide LVK study alongside leading the lensing development calls and effort in that direction, and Mark Cheung together with Simon Yeung, who work on gravitational-wave wave optics modeling efforts, as well as Zhaofeng Wu, who is a PhD at Purdue University.
Nikhef/Utrecht (2019 - 2021): I mentored a PhD student (Justin Janquart) at Nikhef/Utrecht on a project to detect multiply imaged, lensed gravitational-wave events using a likelihood-based methodology that is both faster than the current joint parameter-estimation methods (e.g., Liu et al 2020) and more accurate than the current posterior overlap based methodologies (e.g. Haris et al. 2018). Moreover, I currently supervised two BSc students: One student at Nikhef/Utrecht (Renske Wierda) on a statistical study to determine the strongly lensed gravitational-wave forecasts (which won the best thesis award in 2021), one student in Chicago (Mesut Caliskan; partial supervision) on a topic to investigate potential false alarms in lensed gravitational-wave detections. I also mentored two students in Hong Kong (Mark Cheung, BSc, Joseph Gais, PhD) on a topic to investigate stellar microlensing of gravitational waves.
CUHK (2015-2019): I have been a teaching assistant at CUHK from 2015 to 2019. I had requested additional teaching involving crafting course exercises, holding interactive tutorials, and lecturing for the “gravitational waves” and “guided studies” courses. Moreover, I had made a proposal to craft a workshop series dedicated to help PG students in research. Besides my official teaching duties, I mentored students within our research group.

STUDENT MENTORING

PhD students

- **2024-** *Kailib Doney, CUHK (supervisor)*
    - Co-supervisor: Prof. Tjonnie Li
- **2023-** *Ramon Luichies, Groningen University* (supervisor)
    - Supervisor(s): Leon Koopmans, Chris Van Den Broeck
- **2023-** *Laura Uronen, CUHK* (supervisor) - [link to published research works]
    - Co-supervisor: Justin Janquart (Leuven)
- **2023-** *Samson, Hin Wai Leong, CUHK* (supervisor) - [link to published research works]
    - Co-supervisor: Juan Calderon Bustillo
- **2022-** *Jason, Poon Cheung Chi, CUHK* (supervisor) - [link to published research works]
- **2022-** *Hemantakumar Phurailatpam, CUHK* (supervisor) - [link to published research works]
    - Co-supervisor: Tjonnie Li (KU Leuven)
- **2021-** *Anna Liu, CUHK,* (supervisor) - [link to published research works]
    - Co-supervisor: Tjonnie Li (KU Leuven)
- **2021-2022** *Mesut Çalışkan*, Johns Hopkins University, (research project mentor) - [link to published research works]
    - *Continued work post-graduation*
- **2021-2022** *Narola Harsh*, Utrecht University, (mentor)
- **2020-2022** *Justin Janquart*, Utrecht University, (mentor) - [link to published research works]
    - *Lead of the gravitational-wave lensing software development effort, O4 tutorials, and workflow planning as of 2021*
    - *History of supervising CUHK undergraduate/postgraduate students*
- **2019-2020** *Giulia Pagano,* University of PISA, (research project mentoring) [link to published research work]

MPhil students

- **2025-** *Brian Cheng*, CUHK (supervisor)
    - Daily mentor: Laura Uronen
- **2024-** *Elwin Li*, CUHK (supervisor)
    - Daily mentors: Juno CL Chan (Niels Bohr Institute); AKY Li (UTokyo)
- **2024-** *Charmaine Wong, CUHK* (supervisor)
    - Daily mentor: Thomas Ng, Samson Leong
- **2023-2025** Thomas Ng, CUHK (co-supervisor) - [link to published research work]
    - Co-supervisor: Stefano Rinaldi
    - Moved to Nikhef Institute, Netherlands, for PhD
- **2021-2024** Amit Jit Singh, CUHK (co-supervisor)
- **2021-2022** *Eungwang Seo,* CUHK, (co-supervisor) - [link to published research work]
    - Moved to Glasgow University for PhD
- **2019-2021** *Joseph Gais*, CUHK, (research project mentoring) - [link to published research work]

Bachelor’s students

CUHK

- **2024-2025** *Martes Wong*, CUHK (supervisor)
    - OPUS student
    - FYP Co-supervisor: Alvin Li
- **2023-2025** *On, Xu Yu Ben, CUHK* (supervisor)

    - SURE student (destination: Flatiron Institute, US)
    - Co-supervisor: Kaze Wong
    - Daily mentor: Thomas Ng
- **2024-** *Ryan Zhang, Johns' Hopkins (supervisor)*
    - Co-supervisor: Paul Martens, Samson Leong (daily mentor)
- **2024-** *Helen Xu, CUHK (supervisor)*
    - Co-supervisors: Paul Martens, Thomas Ng (daily mentor), Samson Leong (daily mentor)
    - 2025 SURE program: UK Queen Mary University of London (host supervisor Michalis Agathos)
- **2024-** *Peony Lai, CUHK (supervisor)*
    - Co-supervisors: Paul Martens, Thomas Ng (daily mentor)
    - 2025 SURE program: Japan UTokyo (host supervisor Alvin Li)
- **2024-2025** *Lisa Li, CUHK (supervisor)*
    - Co-supervisors: Hemantakumar Phurailatpam (daily mentor)
- **2023-2025** *Cheng, Brian, CUHK (supervisor)*
    - SURE student (destination: Portsmouth University)
    - Co-supervisor: T. Collett, Laura Uronen & Hemantakumar Phurailatpam (daily mentors)
    - Moved to MPhil at CUHK in 2025
- **2024 Summer** *Louis Chiu, CUHK (supervisor)*
- **2023-2024** *Ng, Chung Yin Leo*, CUHK (supervisor) - [link to published research work]
    - SURE student (destination: Utrecht University, Netherlands)
    - Co-supervisor: Justin Janquart, Hemantakumar Phurailatpam
    - Moved to Penn State for PhD
- **2023-2024** *Wong, Charmaine, CUHK* (supervisor)
    - SURE student (destination: Flatiron Institute, US)
    - Co-supervisor: Kaze Wong
    - Continued in CUHK for MPhil
- **2022-2024** *Aidan, Chong Hang Yan, CUHK (supervisor)* - [link to published research work]
    - SURE student (destination: Caltech, US)
    - Co-supervisor: Alvin Li
    - Continued in CUHK for MPhil
- **2022-2023** *Timothy, Chan Hoi Man*, CUHK, (supervisor)
    - Moved to Stony Brook for PhD
- **2022-2023** *Thomas, Ng Chi Kit, CUHK (supervisor)* - [link to published research work]
    - Continued in CUHK for MPhil
- **2021-2023** *Zhaofeng Wu (CUHK) (supervisor)* - [link to published research work]
    - Co-supervisor: Martin Hendry
- **2021-2022** *Kelvin, Chan Hoi Man*, CUHK, (supervisor) - [link to published research work]
    - Moved to
- **2021-2022** *Simon, Yeung Manchun*, CUHK, (supervisor) - [link to published research work]
    - Moved to UWM, Milwaukee for PhD
- **2021-2022** *Damon, Cheung Hoi Tim*, CUHK, (supervisor) - [link to published research work]
    - Co-supervisor: Stefano Rinaldi
    - Moved to Michigan
- **2021-2022** *Chan Wing Lok*, CUHK, (supervisor) - [link to published research work]
    - Co-supervisor: Martin Hendry
- **2021-2022** *Chad, Chong Cheuk Nam*, CUHK, (SURE daily mentor)
    - Co-supervisor: Michalis Agathos
- **2021-2022** *Aidan, Chong Hang Yan*, CUHK, (SURE daily mentor)
    - Co-supervisor: Alvin Li
- **2020-2021** *Renske Wierda*, Utrecht University, (co-supervisor) - [link to published research works, link to news article]
- **2019-2021** *Mesut Çalışkan*, University of Chicago, (mentor) - [link to published research work]
    - Moved to Johns Hopkins (PhD)
- **2019-2021** *Mark Cheung Ho Yeuk*, CUHK, (research project mentor) - [link to published research work]
    - Moved to Johns Hopking (PhD)
- **2018** *Amit Jit Singh, CUHK* (summer research project student mentor) - [link to published research work]
    - Joined MPhil at CUHK
- **2018** Ivan S.C. Li, Imperial College London, (summer research project student mentor) - [link to published research work]
- **2017** Kaye Li, CUHK, (research project student mentor)
- **2016** Ignacio Magana, UC Santa Barbara, (summer research project student mentor)
- **2016** Gladys Poon, Cambridge University, (summer research project student mentor)

COURSES

(UG=undergraduate; PG=postgraduate)

RESEARCH ASSISTANT PROFESSOR, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

- UG Course: UGEB2401D Astronomy
- UG Course: STAR4050 Seminar III
- UG Course: STAR3050 Seminar II
- UG Course: PHYS4610/PHYS4620 Senior Project I
    - Wong, Martes
        - Topic: Digging out faint sub-threshold gravitational waves

        - Co-supervisor: Alvin Li (UTokyo)
    - Cheng, Brian
        - Topic: Localising cluster-lensed gravitational waves
        - SURE program: ICG Portsmouth (UK) - Summer 2024
        - Daily mentosr: Laura Uronen (pre- and post-summer); Hemantakumar Phurailatpam (pre-summer)
        - To continue graduate studies at CUHK
    - On, Xu Yu Ben
        - Topic: Gravitational waves and machine learning
        - SURE program at Flatiron Institute - *Summer 2023*
            - Supervisors: Kaze Wong
        - To continue graduate studies at CUHK
    - Ng, Chung Yin Leo
        - Topic: Search for gravitational-wave strong lensing
        - SURE program at Utrecht University - *Summer 2023*
            - Supervisors: Justin Janquart, Chris Van Den Broeck
        - To continue graduate studies at Penn State, US.
    - Chan, Yan-Mong Timothy
        - Topic Gravitational-wave doppler lensing
        - To continue graduate studies at Stony Brook University, New York, US
    - Ng, Chi Kit Thomas
        - Topic 1: Gravitational-wave millilensing
          Topic 2: Tests of general relativity
        - SURE program at Flatiron Institute - *Summer 2022*
            - Supervisors: Kaze Wong, Max Isi, Will Farr
        - To continue graduate studies at CUHK
    - Kelvin, Chan Hoi Man
        - Topic: Probing ultralight bosons with binary merger remnants [link]
        - To continue graduate studies at the McGill University, Montreal, Canada
    - Simon, Yeung Manchun
        - Topic: Modeling microlensing wave optics effects [link]
        - To continue graduate studies at the University of Milwaukee, Wisconsin, United States
    - Damon, Cheung Hoi Tim
        - First topic: Gravitational-wave population inference with machine learning [link]
        - Second topic: Bayesian analysis of strongly lensed gravitational waves
            - Project supervised by Stefano Rinaldi (Pisa University)
        - To continue graduate studies at the University of Michigan, Washington, United States
    - Chan Wing Lok
        - Topic: Studying the effect of weak lensing on gravitational-wave inferences of cosmology [link]
        - One term
    - *Jack Kwok: Primary supervision by Tjonnie Li*
        - Continued at Cambridge
- UG Course: STAR4000 Undergraduate Research in Science III
    - Chan Wing Lok
        - Topic: Using electromagnetic lensing observations to debias LISA/TianQin standard siren measurements
        - One term

POSTDOCTORAL RESEARCHER, NIKHEF/UTRECHT UNIVERSITY (THE NETHERLANDS)

- UG Course: BONZ Honor's 1-year Bachelor course [supervised Renske Wierda]
    - Thesis Topic: A population of galaxy-lensed gravitational waves [link to thesis]
    - Won the EMMEPH best thesis award and the work featured in Utrecht News [link, link]
    - Research published in the Astrophysical Journal [link]
    - Continues graduate studies at the Amsterdam University

TEACHING ASSISTANT, CHINESE UNIVERSITY OF HONG KONG (HONG KONG)

- UG Course: Student Centred Learning I
- UG Course: Guided Studies II
- Custom workshops to help PG students with PG studies
- PG Course: *Gravitational Waves*
- PG Course: Guided Studies (General Relativity)
- UG Course: Perspectives in Materials Science
- UG Course: Electromagnetic Theory I

PRESENTATIONS/WORKSHOPS/ORGANIZATION

2024

- Gravitational-wave lensing challenges and opportunities. UCLouvain plenary talk (Belgium) Dec 17, 2024
- Gravitational-wave wave optics lensing simulations and phenomenology. Erwin Schrodinger Institute: Wave optics in strong gravity (2024)
- Gravitational wave lensing overview. Gravitational-wave lensing mini-workshop (Beijing Normal University)
- Organiser, IAS Program on Fundamental Physics 2024
- Gravitational lensing of gravitational waves CosPA24 (Ningbo) June 15-17
- Towards the first detection: the gravitational wave perspective Multimessenger Gravitational Lensing (UK) March 11-12
- High-school student workshop: Gravitational-wave data analysis CUHK (HK) November - post

2023

- Multimessenger Astronomy: Bridging Transients, Lensing, and Dark Matter (Cosmic Frontiers) November 8-9
  - Main organiser
- Gravitational-wave lensing sub-group organization. LVK F2f @ Toyama (Japan) September 11-15, 2023
- Recent work in gravitational-wave lensing. YITP Seminar (Japan) September 4, 2023
- Gravitational-wave lensing YGA2023, 1-3 Aug
- Localizing merging black holes using gravitational-wave lensing Amaldi15 19 July
- Gravitational-wave astronomy. Helsinki University Seminar 13 June
- Exploring gravaitational-wave lensing. PISA University Seminar 9 June
- Future prospects of gravitational-wave lensing. GRASP Opening Workshop 23-25 May (joint talk with Tjonnie Li)
- Gravitational-wave lensing sub-group organization. LVK March 2023 Mar 11-16

2022

- Gravitational-wave lensing talk, AAPPS-DACG Workshop 2022 on Astrophysics, Cosmology, and Gravitation Nov 14-17, 2022
  - Invited talk
- "Story of Gravity" St. Francis of Assissi's English Primary school Oct 13
  - Outreach talk for Hong Kong primary school
- Focus Group for Young Scientists (Astronomy) [HKLF Focus group @ Masterminds, Masterclasses 2.]
  - Moderator
- Gravitational-wave lensing, Boom! An LLSTC workshop (2002), July 25-29, 2022, University of Illinois at Urbana-Champaign, Urbana
  - Invited talk
- Lecture on gravitational lensing of gravitational waves, 65th Workshop on Gravitational Waves and Numerical Relativity, APCTP, Korea
- AI for GW inference, Applications of Artificial Intelligence to Gravitational Wave Science (2022), 18.3.2022
  - Panel member
- What are gravitational waves? CUHK Postgraduate Physics Seminar (2022), 9-10.2.2022

2021

- Gravitational-wave lensing with ground-based gravitational-wave detectors, TAUP (2021), 02.09.2021
- Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run, Amaldi14, 22.07.2021
- Gravitational-wave lensing in the O3a, IGFAE Seminar, 02.06.2021
- LIGO-Virgo gravitational-wave lensing webinar, 05.27.2021
  - Moderator
- Gravitational-wave lensing seminar, UIB Online Seminar, 19.03.2021
- Talk on gravitational-wave lensing at the GdR Gravitational Waves, Cosmology meeting, 28.01.2021

2020

Talk on *Gravitational-wave lensing within ground-based gravitational-wave detectors* at:

- Space Science @ Drop Tower Seminar - Konstantinos Dialektopoulos - 22.09.2020
- theory seminar in Paris at the Institut d'astrophysique de Paris (IAP)
- THC meeting, Leiden

2019

- Talk on *Gravitational Wave Lensing in LIGO/Virgo* Institute of Cosmology and Gravitational (ICG) colloquium, Portsmouth
- Talk on *Extreme Dark Matter Tests with Extreme Mass Ratio Inspirals* GW Probes of Fundamental Physics Workshop, Amsterdam, 11-13 Nov
- Talk on *Probing the existence of ultralight bosons with a single gravitational-wave measurement.* 22nd International Conference on General Relativity and Gravitation/13th Edoardo Amaldi Conference on Gravitational Waves

2018

- Talk on ultralight bosons and their detection at:
  - MIT LIGO Labs on 31.7. (Boston, USA)
  - Johns Hopkins University on 18.7. (Baltimore, USA)
  - University of Wisconsin-Milwaukee on 16.7. (Milwaukee, USA)
- Poster on probing the existence of ultralight bosons with gravitational waves at the "12th International LISA Symposium" 9. - 13.7. (Chicago, USA)
- Talk on discovering binary environments with gravitational waves at the "Gravity and Cosmology 2018" workshop, 29.1. - 9.3. (Kyoto, Japan)

2017

- Invited lecture at the Summer School on gravitational waves at "NCU 2017 Summer Astro Camp" organized by the National Central University (Taiwan, Taoyuan)
  http://lidodo.astro.ncu.edu.tw/PIRE2017SCamp/index.php
  The three-day summer school (28 - 30 June 2017) consisted of undergraduate lectures on gravitational waves and recent progress in the field.

BLOGS, NEWS, AND PRESS RELEASES

2023

- HK Astronomical Society Article on gravitational waves HKAS (2023)

2022

- IOPScience Paper Interview youtube link
- IOPScience Top Cited Paper Award IOPScience (2022)
- CUHK scholars receive China Top Cited Paper Awards from IOP Publishing CUHK Press (2022)
- Hong Kong Laureate Forum Interview youtube link

2021

- One Idea to Explain Dark Matter – Ultralight Bosons – Fails the Test. Universe Today (2021)
- Reanalyzing LIGO-Virgo gravitational wave events under the new lens of… lensing! Astrobites (2021)
- No hints yet of gravitational-wave lensing. Nikhef news (2021)
- New publication by the LIGO-Virgo collaboration: Search for gravitational-wave lensing Utrecht news (2021)
- Scientists hunt for evidence of 'lensed' gravitational waves. Birmingham University Press release (2021)
- When gravity bends gravity: Did gravitational-wave astronomers catch “Gravitational Lenses” at work? LIGO India Press Release (2021)
- Gravity bending gravity: are any of the O3a LIGO-Virgo detections gravitationally lensed? LVC Science Summaries (2021)

2019

- Searching For Ultralight Bosons With Gravitational Waves Asian Scientist (9 May 2019).
- CUHK Probes the Existence of Ultralight Bosons with a Single Gravitational Wave Measurement. CUHK Press (23 April 2019).
- Researchers suggest LISA should be able to see ultralight bosons near supermassive black holes. Phys Org (6 March 2019).
- Gravitational waves could reveal ultralight bosons lurking near black holes. Physics World (5 March 2019).
- Probing the Existence of Ultralight Bosons with a Single Gravitational Wave Measurement. Nature Blog (4 March 2019).

AWARDS, CERTIFICATES AND FELLOWSHIPS

- **2022** IOPScience Top Cited Paper Award
- **2019** CIERA Postdoctoral Fellowship, Northwestern University (awarded but declined)
- **2019** Postgraduate Research Output Award (one member nominated)
- **2017** CUHK Teaching Award
- **2017** Exchange Scholarship (Hong Kong University)
- **2017** Hong Kong PhD Fellowship (full coverage, 2017 - 2019; ~2% of PHY students)
- **2014** CSC Cray XC workshop certificate
- **2013** CSC Advanced Parallel Programming certificate
- **2013** CSC Introduction to Parallel Programming certificate
- **2011** ABB Physics and Maths Stipend
- **2011** Pro Mathematica Medal

MEMBERSHIPS AND RESPONSIBILITIES

- **2023 - current** PI, CUHK LIGO group
- **2022 - current** PI, CUHK KAGRA group (KAGRA)
- **2022 - current** KAGRA Scientific Congress Member (KAGRA)
- **2021 - current** Senior Council Member, LIGO Collaboration
- **2021 - current** Member, LIGO Collaboration
- **2022 - 2025** Co-Chair, LVK lensing sub-group
- **2019 - 2022** Chair, LVK lensing sub-group (under Testing General Relativity analysis group)
- **2019 - 2021** Member, Virgo Collaboration
- **2020 - 2021** Manager and chair, O3a LVC lensing paper
- **2016 - 2019** Member, LIGO Scientific Collaboration
- **2015 - 2019** Member, Physics Postgraduate Society

REFERENCES

References available upon request.