

Tsang Keung Chan: CURRICULUM VITAE

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Work Experience

The Chinese University of Hong Kong	Assistant Professor	Nov 2023
University of Chicago	Inaugural Margaret Burbidge Post-Doctoral Fellow	2022-2023
Institute for Computational Cosmology, Durham University	Postdoctoral Research Associate	2019-2022

Education

University of California, San Diego	Ph.D. in Physics	2013 - 2019
	Thesis advisor: Prof. Dušan Kereš	
The Chinese University of Hong Kong	M.Phil. in Physics	2011 - 2013
	Thesis advisor: Prof. Pui Tang Leung	
The Chinese University of Hong Kong	B.S. in Physics with First-class Honors	2008 - 2011
University of California, Berkeley	Overseas Program for Undergraduate Students	Jan-Aug 2010

Supervision of students

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| • Brian Wan, MPhil at CUHK
<i>"Machine Learning of Cosmological Simulation"</i> | 2025 |
| • Jonathan Tang, MPhil at CUHK
<i>"Separate Universe Simulation and Reionization"</i> | 2024 |
| • Hai-Na Huang, PhD at CUHK
<i>"Primordial Power Spectrum and high redshift universe"</i> | 2023 |
| • Jian-Hao Wu, MPhil at CUHK
<i>"Primordial Power Spectrum and Dark Matter Halos"</i> | 2023 |

International Collaborations

- Feedback In Realistic Environment collaboration
- VIRGO collaboration

Professional Service and Outreach

- Reviewer for International Journals (MNRAS & ApJ & A&A)
- Judge for “Hong Kong Student Science Project Competition” 2025
- Interview for “The 18th Hong Kong Budding Scientists Award” 2025
- Public Talk at *Continuing Education and College Health and Science Lectures* 2023
- Introductory Video¹ at *Royal Society Summer Science Exhibition* 2021

Honors and Awards

- Margaret Burbidge Fellowship, University of Chicago 2022
- HPC-Europa3 Transnational Access programme 2021
- UC San Diego Graduate Student Association Travel Grant 2018
- UC San Diego Physics Chair’s Challenge Travel Grant 2017
- Professor Charles K. Kao Student Research Exchange Scholarship 2010
- Chung Chi Scholarships for Excellence, the Chinese University of Hong Kong 2010
- Dean’s Honours List, the Chinese University of Hong Kong 2009
- CN Yang Scholarship, the Chinese University of Hong Kong 2009, 2011
- Bronze medal, International Physics Olympiad 2007

Grants/Proposals

- Research Committee: Strategic Seed Funding for Collaborative Research Scheme, the Chinese University of Hong Kong 2024
“Connecting Cosmological Simulations with multi-messenger gravitational lensing”
- Early Career Scheme, University Grants Committee, Hong Kong 2024
“Simulating dark matter and gas in the epoch of reionization at high resolutions”
- Direct Grant, Chinese University of Hong Kong 2024,2025
 - ‘Improvement on Competitiveness in Hiring New Faculties’ 2023
 Funding Scheme, Chinese University of Hong Kong
- co-lead a project in Virgo II in 14th DiRAC call 2022
“Virgo II: The Large-scale structure of the Universe”
- co-PI in HST Cycle 30 Proposal 2022
“Elucidating Galaxy Quenching with Absorption Probes of Halos around Low-mass Dwarfs”
- co-lead a project in Virgo I in 13th DiRAC call 2020
“Virgo I: The formation, evolution and clustering of galaxies”
- co-PI in HST Cycle 28 Proposal 2020
“A Benchmark Survey of Resolved Stellar Populations in the Nearest Ultra Diffuse Galaxy, F8D1”

¹https://www.youtube.com/watch?v=p3_o00BD-7Y&list=FLtYC4IcLrlu3-levnlW-1yw&index=2

Selected Presentations

- *Invited Talk* at Physics Seminar 2023
The City University of Hong Kong, Hong Kong
- *Invited Talk* at "Resolving galaxy ecosystems across all scales" conference 2023
The Chinese University of Hong Kong, Hong Kong
- *Invited Talk* at The International Symposium on Cosmology and Particle Astrophysics 2023
The Chinese University of Hong Kong, Hong Kong
- *Invited Talk* at UT Austin extragalactic and cosmology series 2021
at University of Texas at Austin, United States
- *Invited Talk* at CCAPP seminar 2019
at CCAPP, Ohio State University, Ohio, United States
- *Invited Talk* at “*The Bewildering Nature of Ultra-diffuse Galaxies*” workshop 2018
at Lorentz Center, Leiden, Netherlands
- *Talk* at ITC “*Galaxies and Cosmology*” seminar 2018
at ITC, Harvard University, Cambridge, United States
- *Talk* at SFIR seminar 2018
at Princeton University, New Jersey, United States
- Santa Cruz workshop on galaxy formation 2015,2017,2018
at University of California at Santa Cruz, United States
- Feedback In Realistic Environment workshop 2016
at University of California at Berkeley, United States

Publications

As of April 2025, I have total 51 publications (11 first and corresponding author) with total 4685 citations, and H-index 34 ².

First and Corresponding Author

- [1] Jianhao Wu, Tsang Keung Chan, and Victor J. Forouhar Moreno. “Cosmological Zoom-In Simulations of Milky Way Host Size Dark Matter Halos with a Blue-Tilted Primordial Power Spectrum”. In: *arXiv e-prints*, arXiv:2412.16072 (Dec. 2024), arXiv:2412.16072. DOI: 10.48550/arXiv.2412.16072. arXiv: 2412.16072 [astro-ph.CO].
- [2] Tsang Keung Chan et al. “The impact and response of mini-haloes and the interhalo medium on cosmic reionization”. In: *MNRAS* 528.2 (Feb. 2024), pp. 1296–1326. DOI: 10.1093/mnras/stae114. arXiv: 2305.04959 [astro-ph.CO].

²Full list can be found in <https://ui.adsabs.harvard.edu/search/q=orcid%3A0000-0003-2544-054X&sort=date+desc>

- [3] Tsang Keung Chan et al. “Simulations of the reionization of the clumpy intergalactic medium with a novel particle-based two-moment radiative transfer scheme”. In: *The Predictive Power of Computational Astrophysics as a Discover Tool*. Ed. by Dmitry Bisikalo, Dmitri Wiebe, and Christian Boily. Vol. 362. Jan. 2023, pp. 15–20. DOI: 10.1017/S1743921322001235.
- [4] T. K. Chan et al. “The impact of cosmic rays on dynamical balance and disc-halo interaction in L $\star$ disc galaxies”. In: *MNRAS* 517.1 (Nov. 2022), pp. 597–615. DOI: 10.1093/mnras/stac2236. arXiv: 2110.06231 [astro-ph.GA].
- [5] T. K. Chan et al. “Smoothed particle radiation hydrodynamics: two-moment method with local Eddington tensor closure”. In: *MNRAS* 505.4 (Aug. 2021), pp. 5784–5814. DOI: 10.1093/mnras/stab1686. arXiv: 2102.08404 [astro-ph.IM].
- [6] T. K. Chan et al. “Cosmic ray feedback in the FIRE simulations: constraining cosmic ray propagation with GeV γ -ray emission”. In: *MNRAS* 488.3 (Sept. 2019), pp. 3716–3744. DOI: 10.1093/mnras/stz1895. arXiv: 1812.10496 [astro-ph.GA].
- [7] T. K. Chan et al. “The origin of ultra diffuse galaxies: stellar feedback and quenching”. In: *MNRAS* 478.1 (July 2018), pp. 906–925. DOI: 10.1093/mnras/sty1153. arXiv: 1711.04788 [astro-ph.GA].
- [8] T. K. Chan, AtMa P. O. Chan, and P. T. Leung. “Universality and stationarity of the I-Love relation for self-bound stars”. In: *Phys. Rev. D* 93.2, 024033 (Jan. 2016), p. 024033. DOI: 10.1103/PhysRevD.93.024033. arXiv: 1511.08566 [gr-qc].
- [9] T. K. Chan et al. “The impact of baryonic physics on the structure of dark matter haloes: the view from the FIRE cosmological simulations”. In: *MNRAS* 454.3 (Dec. 2015), pp. 2981–3001. DOI: 10.1093/mnras/stv2165. arXiv: 1507.02282 [astro-ph.GA].
- [10] T. K. Chan, AtMa P. O. Chan, and P. T. Leung. “I-Love relations for incompressible stars and realistic stars”. In: *Phys. Rev. D* 91.4, 044017 (Feb. 2015), p. 044017. DOI: 10.1103/PhysRevD.91.044017. arXiv: 1411.7141 [astro-ph.SR].
- [11] T. K. Chan et al. “Multipolar universal relations between f-mode frequency and tidal deformability of compact stars”. In: *Phys. Rev. D* 90.12, 124023 (Dec. 2014), p. 124023. DOI: 10.1103/PhysRevD.90.124023. arXiv: 1408.3789 [gr-qc].

Co-author (Selected)

- [1] Matthieu Schaller et al. “SWIFT: A modern highly-parallel gravity and smoothed particle hydrodynamics solver for astrophysical and cosmological applications”. In: *MNRAS* 530.2 (May 2024), pp. 2378–2419. DOI: 10.1093/mnras/stae922. arXiv: 2305.13380 [astro-ph.IM].
- [2] Andrew Wetzel et al. “Public Data Release of the FIRE-2 Cosmological Zoom-in Simulations of Galaxy Formation”. In: *ApJS* 265.2, 44 (Apr. 2023), p. 44. DOI: 10.3847/1538-4365/acb99a. arXiv: 2202.06969 [astro-ph.GA].
- [3] Erin Kado-Fong et al. “The In Situ Origins of Dwarf Stellar Outskirts in FIRE-2”. In: *ApJ* 931.2, 152 (June 2022), p. 152. DOI: 10.3847/1538-4357/ac6c88. arXiv: 2109.05034 [astro-ph.GA].

- [4] Cameron W. Trapp et al. “Gas infall and radial transport in cosmological simulations of milky way-mass discs”. In: *MNRAS* 509.3 (Jan. 2022), pp. 4149–4170. DOI: 10.1093/mnras/stab3251. arXiv: 2105.11472 [astro-ph.GA].
- [5] Kung-Yi Su et al. “Which AGN jets quench star formation in massive galaxies?” In: *MNRAS* 507.1 (Oct. 2021), pp. 175–204. DOI: 10.1093/mnras/stab2021. arXiv: 2102.02206 [astro-ph.GA].
- [6] Suoqing Ji et al. “Virial shocks are suppressed in cosmic ray-dominated galaxy haloes”. In: *MNRAS* 505.1 (July 2021), pp. 259–273. DOI: 10.1093/mnras/stab1264. arXiv: 2011.04706 [astro-ph.GA].
- [7] Philip F. Hopkins et al. “Testing physical models for cosmic ray transport coefficients on galactic scales: self-confinement and extrinsic turbulence at $\sim$ GeV energies”. In: *MNRAS* 501.3 (Mar. 2021), pp. 4184–4213. DOI: 10.1093/mnras/staa3691. arXiv: 2002.06211 [astro-ph.HE].
- [8] Philip F. Hopkins et al. “Effects of different cosmic ray transport models on galaxy formation”. In: *MNRAS* 501.3 (Mar. 2021), pp. 3663–3669. DOI: 10.1093/mnras/staa3692. arXiv: 2004.02897 [astro-ph.GA].
- [9] Philip F. Hopkins et al. “Cosmic ray driven outflows to Mpc scales from L_* galaxies”. In: *MNRAS* 501.3 (Mar. 2021), pp. 3640–3662. DOI: 10.1093/mnras/staa3690. arXiv: 2002.02462 [astro-ph.GA].
- [10] Alexander B. Gurvich et al. “Pressure balance in the multiphase ISM of cosmologically simulated disc galaxies”. In: *MNRAS* 498.3 (Nov. 2020), pp. 3664–3683. DOI: 10.1093/mnras/staa2578. arXiv: 2005.12916 [astro-ph.GA].
- [11] Alexandres Lazar et al. “A dark matter profile to model diverse feedback-induced core sizes of Λ CDM haloes”. In: *MNRAS* 497.2 (Sept. 2020), pp. 2393–2417. DOI: 10.1093/mnras/staa2101. arXiv: 2004.10817 [astro-ph.GA].
- [12] Suoqing Ji et al. “Properties of the circumgalactic medium in cosmic ray-dominated galaxy haloes”. In: *MNRAS* 496.4 (Aug. 2020), pp. 4221–4238. DOI: 10.1093/mnras/staa1849. arXiv: 1909.00003 [astro-ph.GA].
- [13] Zachary Hafen et al. “The fates of the circumgalactic medium in the FIRE simulations”. In: *MNRAS* 494.3 (May 2020), pp. 3581–3595. DOI: 10.1093/mnras/staa902. arXiv: 1910.01123 [astro-ph.GA].
- [14] Ethan D. Jahn et al. “Dark and luminous satellites of LMC-mass galaxies in the FIRE simulations”. In: *MNRAS* 489.4 (Nov. 2019), pp. 5348–5364. DOI: 10.1093/mnras/stz2457. arXiv: 1907.02979 [astro-ph.GA].
- [15] Philip F. Hopkins et al. “FIRE-2 simulations: physics versus numerics in galaxy formation”. In: *MNRAS* 480.1 (Oct. 2018), pp. 800–863. DOI: 10.1093/mnras/sty1690. arXiv: 1702.06148 [astro-ph.GA].
- [16] Matthew E. Orr et al. “Stacked Star Formation Rate Profiles of Bursty Galaxies Exhibit “Coherent” Star Formation”. In: *ApJL* 849.1, L2 (Nov. 2017), p. L2. DOI: 10.3847/2041-8213/aa8f93. arXiv: 1709.10099 [astro-ph.GA].