Tsang Keung Chan: CURRICULUM VITAE

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Work Experience

University of Chicago	**Inaugural Margaret Burbidge Post-Doctoral Fellow**	2022-present
Institute for Computational Cosmology, Durham University	**Postdoctoral Research Associate**	2019-2022

Education

University of California, San Diego	**Ph.D. in Physics** Thesis advisor: Prof. Dušan Kereš	2013 - 2019
The Chinese University of Hong Kong	**M.Phil. in Physics** Thesis advisor: Prof. Pui Tang Leung	2011 - 2013
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

Research Interests: *Cosmological (galaxy) simulations*

- Radiative Transfer in cosmological simulations
- The structure of dark matter halos
- Cosmological simulations of galaxy formation
- Cosmic ray feedback in galaxy simulations
- The origin of ultra diffuse galaxies

Research Experiences and Skills

- Collaborating with members from different major universities, resulting in tens of publications
- Handling and analysing thousands TB data sets
- Running large scale simulations on several national supercomputing centers
- Programming in python, C, fortran, mathematica

- Parallel computing with MPI and OpenMP
- Develop new radiation hydrodynamics method and modules in the SWIFT code
- Co-developing modules in the GIZMO code

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

- 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"

Teaching

- Small group tutorial for PHYS1122 *"Foundations of Physics I"* 2019-22
  at Durham University
- Teaching assistant for PHYS 7 *"Galaxies and Cosmology"* 2016
  by Prof. Karin Sandstrom, at University of California at San Diego
- Teaching assistant for PHY2005 *"Quantitative Methods for Basic Physics II"* 2013
  by Prof. Emily S.C. Ching, at the Chinese University of Hong Kong
- Teaching assistant for PHY2351 *"Basic Computational Physics"* 2012
  by Dr. Lin Lap Ming, at the Chinese University of Hong Kong

Supervision of students

- Melissa Seabrook *"Formation of Galactic Bulges"* 2020
  co-supervised with Prof. Tom Theuns, at Durham University

Professional Service

- Reviewer for International Journals (MNRAS & ApJ & A&A)

Outreach

- Introductory Video[1] at *Royal Society Summer Science Exhibition* 2021
- Laboratory Demonstrator at *Tech Trek* 2017
- Laboratory Demonstrator at *IOA Science & Innovation camp* 2017
- Academic Officer of *Chinese University of Hong Kong Astronomy Club* 2011

Publications

As of September 2021, I have total 43 publications (8 first-author) with total 1980 citations, and H-index 28 [2].

First Author

[1] T. K. Chan et al. "The impact of cosmic rays on dynamical balance and disc-halo interaction in L⋆ disc galaxies". In: *MNRAS* 517.1 (Nov. 2022), pp. 597–615. DOI: 10.1093/mnras/stac2236. arXiv: 2110.06231 [astro-ph.GA].

[2] 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].

[3] 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].

[4] 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].

[5] 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].

[6] 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].

[7] 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].

[8] 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].

[1] https://www.youtube.com/watch?v=p3_oO0BD-7Y&list=FLtYC4IcLrlu3-levnlW-1yw&index=2

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

Reports

- Summer Research Report on "the effect of muon propagation on underground dark matter detection experiments", with Prof. Kam Biu Luk in University of California Berkeley, Aug 2010

Presentations

Talks

- *Talk* at Department of Physics Seminar 2022
  The Chinese University of Hong Kong, Hong Kong
- *Invited Talk* at Friday Astronomy Colloquium 2021
  University of Sussex, United Kingdom
- *Invited Talk* at UT Austin extragalactic and cosmology series 2021
  at University of Texas at Austin, United States
- *Talk* at National Astronomy Meeting 2021
  University of Bath, United Kingdom
- *Talk* at SAZERAC 2.0 2021
  Online
- *Talk* at Durham-Edinburgh Extragalactic Workshop XVII 2021
  at Durham University, Durham, United Kingdom
- *Talk* at VIRGO meeting 2020
  at Durham University, Durham, United Kingdom
- *Talk* at Durham-Edinburgh Extragalactic Workshop XVI 2020
  at Durham University, Durham, United Kingdom
- *Invited Talk* at CCAPP seminar 2019
  at CCAPP, Ohio State University, Ohio, United States
- *Invited Talk* at *"The Bewildering Nature of Ultra-diffuse Galaxies"* 2018
workshop
  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
- Santa Cruz workshop on galaxy formation 2015,2017,2018
  at University of California at Santa Cruz, United States
- Galaxy Formation and Evolution in Southern California 2017
  at California institute of technology, Pasadena,United States
- Feedback In Realistic Environment workshop
  at University of California at Berkeley, United States 2016
  at California institute of technology, Pasadena, United States 2015
  at Northwestern University, Evanston, United States 2014

Poster Presentations

- 15th Potsdam Thinkshop 2018
  on *"Understanding the role of feedback in galaxy formation"*
  at Potsdam, Germany
- 228th American Astronomical Society meeting 2016
  at San Diego, United States

References

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