CURRICULUM VITAE

Dr. **Shihong Liao**

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EDUCATION

- PhD (08/2011 - 08/2015): **The Chinese University of Hong Kong** (CUHK), Hong Kong
  - ⋆ Thesis: *Simulations of Large-scale Structures in Cosmology*
  - ⋆ Supervisor: Prof. Ming-chung Chu
  - ⋆ Date of degree awarded: 12/03/2015
- BS (09/2007 - 06/2011): **Sun Yat-sen University** (SYSU), China
  - ⋆ Thesis: *Numerical Simulations of Critical Phenomena in the 3D Site-diluted Ising Models*
  - ⋆ Supervisor: Prof. Fan Zhong
  - ⋆ Date of degree awarded: 06/24/2011

ACADEMIC WORK EXPERIENCE

- Postdoc (09/2015 - Present): National Astronomical Observatories, Chinese Academy of Sciences (NAOC)
  - ⋆ Supervisors: Prof. Liang Gao and Prof. Jie Wang
  - ⋆ Duties: leading/collaborating research projects, developing/performing/analyzing numerical simulations, applying for research grants, co-supervising students

RESEARCH INTERESTS

- Structure formation in the Universe
- Galaxy formation and evolution
- Cosmological N-body/hydrodynamic simulations
- Neutrino cosmology
- Gravitational waves in cosmology
- Numerical methods

SELECTED TALKS

- 08/16/2019: *Ultra-diffuse gaalxies and dark-matter-deficient galaxies*, the 2nd HOUYI Workshop, Kunming
- 07/03/2018: *Ultra-diffuse galaxies in cosmological simulations*, the 20th CAS Guoshoujing Symposium on Galaxies and Cosmology, Henan
- 03/26/2018: *How do galaxies get their gas?*, Seminar, Department of Physics, CUHK, Hong Kong
- 01/25/2018: *An alternative method to set up pre-initial conditions for cosmological N-body simulations*, Mini-workshop on Cosmology, Hong Kong
- 12/06/2016: *The segregation of baryons and dark matter during halo assembly*, the 11th Sino-German Workshop on Galaxy and Cosmology, Guangzhou
- 10/24/2016: *The segregation of baryons and dark matter during halo assembly*, the 7th East Asia Numerical Astrophysics Meeting, Beijing
- 10/31/2015: *A universal angular momentum profile for dark matter haloes*, Journal Club, Peking University, Beijing
- 04/12/2015: *Angular momentum-mass relation in dark matter haloes*, APS April Meeting, Baltimore
- 10/22/2014: *Angular momentum-mass relation in dark matter haloes*, the Sino-French LIA-ORIGINS Workshop, Beijing
- 06/07/2014: *Pairwise velocity in cosmological N-body simulations*, the 17th Conference of The Physical Society of Hong Kong, Hong Kong
- 06/22/2013: *Angular momentum-mass relation in dark matter haloes*, the 16th Conference of The Physical Society of Hong Kong, Hong Kong

VISITS

- 03/2018: Department of Physics, CUHK (Prof. Ming-chung Chu)
- 10 - 11/2017: Institute for Computational Cosmology, Durham University (Prof. Carlos S. Frenk)
- 03/2015: Computational Cosmology Group, NAOC (Prof. Jie Wang)
- 10/2014: Department of Astronomy, Peking University (Prof. Zuhui Fan)
- 03/2013: Center for Astronomy and Astrophysics, Shanghai Jiao Tong University (Prof. Yipeng Jing)

RESEARCH GRANTS

- National Natural Science Foundation of China (NSFC) Young Scientists Fund
- Young Researcher Grant of NAOC

SUPERVISING EXPERIENCES

- Yun Liu: *Properties of dark matter haloes in the interacting dark energy models* (08/2019 - Present)
  - ⋆ Master student project
  - ⋆ Co-supervised (with Prof. Xiangkun Liu)
- Tianchi Zhang: *Impacts of pre-initial conditions on dark matter halo properties* (01/2019 - Present)
  - ⋆ PhD student project
  - ⋆ Supervised
- Jia Hu: *Studying the impact of filaments on galaxy formation with the Auriga simulations* (03 - 05/2019)
  - ⋆ Undergraduate thesis project
  - ⋆ Co-supervised (with Prof. Liang Gao)
- Tianchi Zhang: *Optimal gravitational softening length for cosmological N-body simulations* (05/2016 - 05/2018)
  - ⋆ PhD student project
  - ⋆ Co-supervised (with Prof. Liang Gao)
  - ⋆ Paper published in MNRAS (Zhang et al. 2019, MNRAS, 487, 1227)
- Haonan Zheng: *Halo growth in filaments* (02 - 06/2017)
  - ⋆ Undergraduate thesis project
  - ⋆ Co-supervised (with Prof. Liang Gao)
- Yvonne Ng, Ben Siu & Jian Zheng: *Cosmology and N-body simulations* (07 - 08/2013)
  - ⋆ Undergradute summer project
  - ⋆ Co-supervised (with Prof. Ming-chung Chu)

TEACHING EXPERIENCES

- 2014 & 2015: Teaching assistance on *Quantum Physics II*
- 2014: Teaching assistance on *University Physics III*
- 2012 & 2013: Teaching assistance on *Quantitative Methods for Basic Physics II*
- 2011 & 2012: Teaching assistance on *Quantum Physics I*

  I was awarded a teaching assistance prize for my performance in the teaching duties and my help to students.

AWARDS

- CUHK Studentship, 2011 - 2015
- Teaching Assistance Award, 2014
- Best Student Presentation Award Runner-Up on the 16th Conference of The Physical Society of Hong Kong, 2013
- China National Scholarship, 2010

- First Prize of the 10th Undergraduate Physics Experiments Competition in Guangdong Province (Designing a device to detect infrasound), 2009
- SYSU Scholarship, 2008 & 2010

COMPUTER & SIMULATION SKILLS

- Programming languages: C/C++, Python, MPI/OpenMP
- Operating systems: Linux, Windows, Mac OS
- Experienced in cosmological simulations: performing simulations (N-GenIC/2LPTic/MUSIC, CAMB, GADGET), finding haloes (AHF, FOF, SUBFIND), and many own data-analysis codes (e.g. merger tree, power spectrum, correlation function, pairwise velocity, cosmic web classification, etc.)
- Public codes: `ccvt-preic`, an OpenMP-optimized code to generate pre-initial conditions (particle loads) with the Capacity Constrained Voronoi Tessellation method (https://github.com/liaoshong/ccvt-preic)

LANGUAGES

English, Chinese (Mandarin & Cantonese)

OUTREACH

- Physics experiment demonstration for annual Open Days, CUHK, Open Days of 2012-2014
- Colloquium for undergraduate students: *Cosmic inflation and B-mode polarization in cosmic microwave background* (Speakers: Ming-chung Chu, King Lau and Shihong Liao), CUHK, 03/28/2014
- Popular science book: *Let's Talk About Special Relativity* (Chinese Edition), Hunan Science & Technology Press, 2010, ISBN 9787535761200
- Popular science talk: *What Dose Canton Tower Look Like in the Relativistic World?*, Xiaoguwei Science Forum, Guangdong Science Center, 12/12/2010