KAI WANG 王凯

Contact Information:
Kavli Institute for Astronomy and Astrophysics,
Peking University, 5 Yiheyuan Road,
Haidian District, Beijing 100871, P. R. China

Email: wkcosmology@gmail.com
Homepage: www.KosmosWalker.com
OCRID: 0000-0002-3775-0484

RESEARCH INTERESTS

- Galaxy-Halo Connection: *galaxy group identification; secondary galaxy-halo connections*
- Dark Matter Halo: *protohalo; halo assembly bias; halo structure*
- Protoclusters: *protocluster identification; protocluster evolution*
- Galaxy Quenching: *environmental quenching; relation to the galaxy-halo connection*

WORKING EXPERIENCE

- KIAA Fellow, Kavli Institute for Astronomy and Astrophysics, **Peking University** since Jul. 2022

EDUCATION

- Ph.D. in Astronomy, **Tsinghua University** Sep. 2017 - Jul. 2022
  Supervisors: Prof. Cheng Li & Prof. Houjun Mo, Thesis: Finding galaxy groups/clusters at z∼1 and its application
- Visiting Scholar, **University of Massachusetts, Amherst** Nov. 2019 - Oct. 2021
  Supervisor: Prof. Houjun Mo
- B.S. in Astronomy, **University of Science and Technology of China (USTC)** Sep. 2013 - Jul. 2017

STUDENT MENTORSHIP

- Zeyu Gao, graduate at Peking University since Nov. 2022
  Project: Decoding the SEDs of galaxies with a prior from hydrodynamical simulations
- Xunda Sun, graduate at the University of Chinese Academy of Sciences since Jun. 2023
  Project: Characterizing the spatial distribution of the metal content for galaxies in FIRE2
- Jiaqi Wang, graduate at Shanghai Jiao Tong University since Dec. 2023
  Project: Observational evidence of the halo assembly bias effect for protohalo size
- Zhijun Zhang, undergraduate at Peking University Sep. 2022 - Jun. 2023
  Bachelor Thesis: Identify protoclusters from high-redshift photometric surveys

GRANTS

- KIAA fellow start-up research funding Jul. 2022 - Jul. 2024
  50,000CNY
- China Scholarship for the Visiting Scholar Nov. 2019 - Oct. 2021
  China Scholarship Council (CSC), $45,600
- National Astronomy Training Base Jun. 2016 - Jun. 2017
  Measure the conditional luminosity functions of galaxies at z∼0.6 using CLAUDS and BOSS, 20,000CNY
- National Astronomy Training Base May 2015 - May 2016
  Thermal gravitational-wave background in the general pre-inflationary scenario, 20,000CNY

TEACHING

- Cosmology and Galaxy Evolution — Guest Lecturer, Peking University, Autumn 2023
- Observational Cosmology — Teaching Assistant, Tsinghua University, Autumn 2017
- Particle Cosmology — Teaching Assistant, USTC, Spring 2017
- General Relativity — Teaching Assistant, USTC, Autumn 2016

HONORS AND AWARDS

- MUST Fellowship (declined) 2022
- Comprehensive scholarship (2nd class) of Tsinghua University 2020
- Comprehensive scholarship (1st class) of Tsinghua University 2019
- Future Scholar Scholarship of Tsinghua University 2017
- Outstanding Graduate of USTC 2017
- National Inspirational Award 2016
- Excellent Student Scholarship (Silver Award) 2014
- Excellent Student Scholarship (Bronze Award) 2013

SERVICE

- **Professional Service**
  Referee for MNRAS, ApJ, and A&A
- **Departmental Service**
  Faculty Candidate Interview Committee at KIAA, Postdoc Representative 2023, 2024
  Co-organizer of weekly Galaxy Party at KIAA 2023
  Co-organizer of the Postdoc Science Day at KIAA 2022
  Co-organizer of the Speaker Lunch at the Tsinghua Center for Astrophysics 2018-2019

SELECTED TALKS

- Galread: Princeton/IAS Galaxy Journal Club
  Characterizing the assembly of dark matter halos with protohalo size histories — *Remote, Oct. 2023*
- UC Santa Cruz CGI (Cosmology/Galaxies/IGM) Seminar
  Characterizing the assembly of dark matter halos with protohalo size histories — *Remote, Oct. 2023*
- Collaboration Workshop on Cosmology and Galaxy Formation
  Relating Galaxies across Cosmic Time to study galaxy evolution — *Shanghai, Jun. 2023*
- 25th Chinese Astronomical Society Guoshoujing Symposium on Galaxies and Cosmology
  Central Galaxy Quenching and its Relation to Halo Formation Time & Large-scale Environment — *Huangshan, May 2023*
- Conference of Star Formation and Nuclei Activity in Galaxies
  Central Galaxy Quenching and its Relation to Halo Formation Time & Large-scale Environment — *Nanjing, Mar. 2023*
- KIAA-DoA Seminar, Peking University
  Central Galaxy Quenching and its Relation to Halo Formation Time & Large-scale Environment — *Beijing, Mar. 2023*
- Lunch Talk at the Department of Astronomy, Tsinghua University
  Relating galaxies across different redshift — *Beijing, Nov. 2022*
- Lunch Talk at Kavli-IPMU, University of Tokyo
  Finding proto-clusters to trace galaxy evolution — *Remote, Jun. 2021*
- The 11-th Prime Focus Spectrograph collaboration meeting
  Identifying galaxy groups from high-z and incomplete spectroscopic surveys — *Pasadena, Dec. 2019*
- The 10-th Prime Focus Spectrograph collaboration meeting
  Finding groups/clusters of galaxies in the PFS galaxy evolution survey — *Shanghai, Dec. 2018*

PUBLICATION

✦**23** publications; **10** as the first/corresponding author; **173** citations; *H*-index: **7**

✦Open in NASA/ADS Library

First/Corresponding author papers:*

1. **Kai Wang**, Houjun Mo, Yangyao Chen, Joop Schaye, MNRAS accepted (2023) [arXiv: 2310.00200]
   An efficient and robust method to estimate halo concentration based on the method of moments
2. **Kai Wang**, Houjun Mo, Yangyao Chen, et al. submitted to MNRAS (2023) [arXiv: 2309.01039]
   Characterize the assembly of dark matter halos with protohalo size histories: I. Redshift evolution, relation to descendant halos, and halo assembly bias
3. **Kai Wang**, Xin Wang, Yangyao Chen, ApJ, 951, 66 (2023) [arXiv: 2305.08161]
   Environmental dependence of the mass-metallicity relation in cosmological hydrodynamical simulations
4. **Kai Wang**, Yangyao Chen, Qingyang Li, Xiaohu Yang, MNRAS, 522, 3188 (2023) [arXiv: 2304.07189]
   Late-formed halos prefer to host quiescent central galaxies. I. Observational results
5. **Kai Wang**, Yingjie Peng, Yangyao Chen, MNRAS 523, 1268 (2023) [arXiv: 2304.06886]
   Dissect two-halo galactic conformity effect: The dependence of star formation activities on the large-scale environment for central galaxies
6. **Kai Wang**, Houjun Mo, Cheng Li, Yangyao Chen, MNRAS 520, 1774 (2023) [arXiv: 2211.00485]
   Relating galaxies across different redshift to study galaxy evolution
7. **Kai Wang**, Houjun Mo, Cheng Li, Yangyao Chen, MNRAS 505, 3892 (2021) [arXiv: 2104.12223]
   Finding proto-clusters to trace galaxy evolution: I. The finder and its performance
8. **Kai Wang**, Houjun Mo, Cheng Li, Jiacheng Meng, Yangyao Chen, MNRAS 499, 89 (2020) [arXiv: 2006.05426]
   Identifying galaxy groups at high redshift from incomplete spectroscopic data: I. The group finder and application to zCOSMOS
9. **Kai wang**, Larissa Santos, Jun-Qing Xia, Wen Zhao, JCAP 01, 053 (2017) [arXiv: 1608.04189]
   Thermal gravitational-wave background in the general pre-inflationary scenario
10. Yi-Fan Wang, **Kai Wang***, Wen Zhao, RAA 16, 4 (2016) [arXiv: 1511.01220]
    Smoothing methods comparison for CMB E- and B-mode separation

Co-author papers:

11. Tao Wang et al. Submitted to Nature (2023) [arXiv: 2311.07653]
    Black holes regulate cold gas accretion in massive galaxies
12. Yangyao Chen, H.J Mo, **Kai Wang,** MNRAS 526, 2542 (2023) [arXiv: 2304.13890]
    Massive Dark Matter Halos at High Redshift: Implications for Observations in the JWST Era
13. Cheqiu Lyu et al. ApJ 959, 5 (2023) [arXiv: 2310.10733]
    From Halos to Galaxies. VII. The Connections Between Stellar Mass Growth History, Quenching History, and Halo Assembly History for Central Galaxies
14. Jiacheng Meng et al. Submitted to ApJ (2023) [arXiv: 2008.13733]
    Measuring galaxy abundance and clustering at high redshift from incomplete spectroscopic data: Tests on mock catalogs
15. Yangyao Chen et al. MNRAS 525, 1254 (2023) [arXiv: 2301.08972]
    A Conditional Abundance Matching Method of Extending Simulated Halo Merger Trees to Resolve Low-Mass Progenitors and Sub-halos
16. Qingyang Li et al. ApJ 933, 9 (2022) [arXiv: 2205.05517]
    Groups and Protocluster Candidates in the CLAUDS and HSC-SSP Joint Deep Surveys
17. Yangyao Chen et al. MNRAS 507, 2510 (2021) [arXiv: 2106.03984]
    MAHGIC: A Model Adapter for the Halo-Galaxy Inter-Connection
18. Zhaoyu Wang et al. Sci. China Phys. Mech. Astron. 64, 289811 (2021) [arXiv: 2106.14159]
    The clustering of galaxies in the DESI imaging legacy surveys DR8:I. the luminosity and color dependent intrinsic clustering

19.Yangyao Chen et al. MNRAS 504, 4865 (2021) [arXiv: 2009.12467]
How to empirically model star formation in dark matter halos: I. Inferences about central galaxies from numerical simulations
20.Yangyao Chen et al. ApJ, 899, 81 (2020) [arXiv: 2003.05137]
Relating the structure of dark matter halos to their assembly and environment
21.Jia-Ni Ye, **Kai Wang**, Yi-Fu Cai, Eur. Phys. J. C 77:720 (2017) [arXiv: 1705.10956]
Superconducting cosmic strings as sources of cosmological fast radio bursts
22.Larissa Santo et al. JCAP, 01, 043 (2017) [arXiv: 1612.03564]
Statistical imprints of CMB B-type polarization leakage in an incomplete sky survey analysis
23.Larissa Santo et al. JCAP 07, 029 (2016) [arXiv: 1510.07779]
Probing the statistical properties of CMB B-mode polarization through Minkowski Functionals

REFERENCES

- Prof. Houjun Mo — University of Massachusetts, Amherst
  hjmo@umass.edu
- Prof. Cheng Li — Tsinghua University
  cli2015@tsinghua.edu.cn
- Prof. Yingjie Peng — KIAA, Peking University
  yjpeng@pku.edu.cn
- Prof. Zheng Cai — Tsinghua University
  zcai@tsinghua.edu.cn
- Prof. Fangzhou Jiang — KIAA, Peking University
  fangzhou.jiang@pku.edu.cn