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 connection*
- 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 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, Postdoc Representative   2022
  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**, et al. (2023) An efficient and robust method to estimate halo concentration based on the method of moments MNRAS accepted [arXiv: 2310.00200]

2. **Kai Wang**, et al. (2023) Characterize the assembly of dark matter halos with protohalo size histories: I. Redshift evolution, relation to descendant halos, and halo assembly bias submitted to MNRAS [arXiv: 2309.01039]

3. **Kai Wang**, et al. (2023) Environmental dependence of the mass-metallicity relation in cosmological hydrodynamical simulations ApJ, 951, 66

4. **Kai Wang**, et al. (2023) Late-formed halos prefer to host quiescent central galaxies. I. Observational results MNRAS, 522, 3188

5. **Kai Wang**, et al. (2023) Dissect two-halo galactic conformity effect: The dependence of star formation activities on the large-scale environment for central galaxies MNRAS 523, 1268

6. **Kai Wang**, et al. (2023) Relating galaxies across different redshift to study galaxy evolution MNRAS 520, 1774

7. **Kai Wang**, et al. (2021) Finding proto-clusters to trace galaxy evolution: I. The finder and its performance MNRAS 505, 3892

8. **Kai Wang**, et al. (2020) Identifying galaxy groups at high redshift from incomplete spectroscopic data: I. The group finder and application to zCOSMOS MNRAS 499, 89

9. **Kai wang**, et al. (2017) Thermal gravitational-wave background in the general pre-inflationary scenario JCAP 01, 053

10. Yi-Fan Wang, **Kai Wang***, et al. (2016) Smoothing methods comparison for CMB E- and B-mode separation RAA 16, 4

Co-author papers:

11. Tao Wang et al. (2023) Black holes regulate cold gas accretion in massive galaxies Submitted to Nature [arXiv: 2311.07653]

12. Yangyao Chen, H.J Mo, **Kai Wang** (2023) Massive Dark Matter Halos at High Redshift: Implications for Observations in the JWST Era MNRAS 526, 2542

13. Cheqiu Lyu et al. (2023) From Halos to Galaxies. VII. The Connections Between Stellar Mass Growth History, Quenching History, and Halo Assembly History for Central Galaxies ApJ 959, 5

14. Jiacheng Meng et al. (2023) Measuring galaxy abundance and clustering at high redshift from incomplete spectroscopic data: Tests on mock catalogs Submitted to ApJ

15. Yangyao Chen et al. (2023) A Conditional Abundance Matching Method of Extending Simulated Halo Merger Trees to Resolve Low-Mass Progenitors and Sub-halos MNRAS 525, 1254

16. Qingyang Li et al. (2022) Groups and Protocluster Candidates in the CLAUDS and HSC-SSP Joint Deep Surveys ApJ 933, 9

17. Yangyao Chen et al. (2021) MAHGIC: A Model Adapter for the Halo-Galaxy Inter-Connection MNRAS 507, 2510

18. Zhaoyu Wang et al. (2021) The clustering of galaxies in the DESI imaging legacy surveys DR8:I. the luminosity and color dependent intrinsic clustering Sci. China Phys. Mech. Astron. 64, 289811

19. Yangyao Chen et al. (2021) How to empirically model star formation in dark matter halos: I. Inferences about central galaxies from numerical simulations MNRAS 504, 4865

20. Yangyao Chen et al. (2020) Relating the structure of dark matter halos to their assembly and environment ApJ, 899, 81

21. Jia-Ni Ye, **Kai Wang**, et al. (2017) Superconducting cosmic strings as sources of cosmological fast radio bursts Eur. Phys. J. C 77:720

22. Larissa Santo et al. (2017) Statistical imprints of CMB B-type polarization leakage in an incomplete sky survey analysis JCAP, 01, 043

23. Larissa Santo et al. (2016) Probing the statistical properties of CMB B-mode polarization through Minkowski Functionals JCAP 07, 029

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