

KAI WANG 王凯

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RESEARCH

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

EXPERIENCE

- Postdoctoral Research Associate, ICC and CEA, **Durham University** Since Jul. 2024
- KIAA Fellow, Kavli Institute for Astronomy and Astrophysics, **Peking University** Jul. 2022 - Jun. 2024

EDUCATION

- Ph.D. in Astronomy, **Tsinghua University** Sep. 2017 - Jul. 2022
Supervisors: Prof. Cheng Li & Prof. Houjun Mo, Thesis: Finding galaxy groups/clusters at $z\sim 1$ 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

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 $z\sim 0.6$ 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

- T. D. Lee Postdoctoral Fellowship (declined) 2024
- 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

TALKS

- Lunch talk at South-Western Institute For Astronomy Research, Yunnan University
Galaxy formation within and without dark matter halos Kunming, Apr. 2024
- Conference of the Co-evolution of galactic eco-systems and their large-scale environments
Dissecting two-halo galactic conformity effect for central galaxies Hangzhou, Apr. 2024
- Astronomical Seminar at the Huazhong University of Science and Technology
Galaxy formation within and without dark matter halos Wuhan, Mar. 2024
- ITC Luncheon
How to connect galaxies across cosmic time? Cambridge, Jan. 2024
- Steward/NOIRLab Galaxy Group Talk
How to connect galaxies across cosmic time? Tucson, Jan. 2024
- Carnegie arXiv Tea
Relating galaxies across different redshift to study galaxy evolution Pasadena, Jan. 2024
- KIPAC tea talk at Stanford University
Characterizing the assembly of dark matter halos with protohalo size histories Stanford, Jan. 2024
- UC Santa Cruz CGI (Cosmology/Galaxies/IGM) Seminar
Central Galaxy Quenching and its Relation to Halo Formation Time & Large-scale Environment Santa Cruz, Jan. 2024

- 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
- The 2nd Shanghai Assembly on Cosmology and Structure Formation
Characterizing the assembly of dark matter halos with protohalo size histories Shanghai, 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

◆ 25 publications; 10 as the first/corresponding author; 203 citations; H-index: 8

◆ [Open in NASA/ADS Library](#)

First/Corresponding* author papers:

1. **Kai Wang**, Houjun Mo, Yangyao Chen, Joop Schaye, MNRAS, 527, 10760 (2024) [[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. MNRAS, 528, 2046 (2024) [[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. Cheqiu Lyu et al. Submitted to ApJ (2024)

From Halos to Galaxies. IX. Accurate estimate of halo assembly history for SDSS galaxy groups

12. Qinxun Li et al. Submitted to ApJ (2024) [arXiv: 2402.10740]

Black-Hole-to-Halo Mass Relation From UNIONS Weak Lensing

13. Tao Wang et al. Submitted to Nature (2023) [arXiv: 2311.07653]

Black holes regulate cold gas accretion in massive galaxies

14. 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

15. 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

16. 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

17. 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

18. Qingyang Li et al. ApJ 933, 9 (2022) [arXiv: 2205.05517]

Groups and Protocluster Candidates in the CLAUDS and HSC-SSP Joint Deep Surveys

19. Yangyao Chen et al. MNRAS 507, 2510 (2021) [arXiv: 2106.03984]

MAHGIC: A Model Adapter for the Halo-Galaxy Inter-Connection

20. 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

21. 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

22. Yangyao Chen et al. ApJ, 899, 81 (2020) [arXiv: 2003.05137]

Relating the structure of dark matter halos to their assembly and environment

23. 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

24. 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

25. Larissa Santo et al. JCAP 07, 029 (2016) [arXiv: 1510.07779]

Probing the statistical properties of CMB B-mode polarization through Minkowski Functionals

REFERENCES

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- Prof. Houjun Mo University of Massachusetts, Amherst
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 - Prof. Cheng Li Tsinghua University
✉ cli2015@tsinghua.edu.cn
 - Prof. Yingjie Peng KIAA, Peking University
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 - Prof. Zheng Cai Tsinghua University
✉ zcai@tsinghua.edu.cn
 - Prof. Fangzhou Jiang KIAA, Peking University
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