

KAI WANG 王凯

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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 of 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 $z \sim 1$ 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

STUDENT MENTORSHIP

- Zeyu Gao, graduate at Peking University since Nov. 2022
Project: Decoding SEDs of galaxies with a prior from hydrodynamical simulations
- Zhijun Zhang, undergraduate at Peking University Sep. 2022 - Jun. 2023
Bachelor Thesis: Identify protoclusters from high-redshift photometric surveys

SERVICE

• Professional Service

Referee for MNRAS, ApJ, and A&A

• Departmental Service

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

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

GRANTS

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

HONORS AND AWARDS

- KIAA Fellowship 2022
- 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
- Encouraging Scholars of USTC 2016
- Excellent Student Scholarship (Silver Award) 2014
- Excellent Student Scholarship (Bronze Award) 2013

SELECTED TALKS

- 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

♦ **22** publications; **10** as the first/corresponding author; **153** 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](#) submitted to MNRAS [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. 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
12. 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 accepted
13. Jiacheng Meng, et al. (2023) [Measuring galaxy abundance and clustering at high redshift from incomplete spectroscopic data: Tests on mock catalogs](#) Submitted to ApJ
14. 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
15. Qingyang Li et al. (2022) [Groups and Protocluster Candidates in the CLAUDS and HSC-SSP Joint Deep Surveys](#) ApJ 933, 9
16. Yangyao Chen et al. (2021) [MAHGIC: A Model Adapter for the Halo-Galaxy Inter-Connection](#) MNRAS 507, 2510
17. 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
18. 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
19. Yangyao Chen et al. (2020) [Relating the structure of dark matter halos to their assembly and environment](#) ApJ, 899, 81
20. Jia-Ni Ye, **Kai Wang**, et al. (2017) [Superconducting cosmic strings as sources of cosmological fast radio bursts](#) Eur. Phys. J. C 77:720
21. Larissa Santo et al. (2017) [Statistical imprints of CMB B-type polarization leakage in an incomplete sky survey analysis](#) JCAP, 01, 043
22. Larissa Santo et al. (2016) [Probing the statistical properties of CMB \$B\$ -mode polarization through Minkowski Functionals](#) JCAP 07, 029

REFERENCES

- Prof. Houjun Mo
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