Chen, Zhaoting

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I work on neutral hydrogen intensity mapping with MeerKAT and the future SKAO.

Education

Ph.D. in Astrophysics (expected Sept. 2023) 2020–2023
Jodrell Bank Centre for Astrophysics, University of Manchester
Supervisor: Dr. Laura Wolz
Co-Supervisor: Prof. Richard Battye

M.Sc. in Astronomy and Astrophysics (Distinction) 2019–2020
Jodrell Bank Centre for Astrophysics, University of Manchester
Supervisor: Dr. Laura Wolz
Co-Supervisor: Prof. Richard Battye

- Thesis: "Interferometric Neutral Hydrogen Intensity Mapping"

B.Sc. in Physics 2015–2019
University of Science and Technology of China (USTC)
Supervisor: Prof. Yi-Fu Cai

Experience

Project Supervisor 2022
Nuffield summer placement, Nuffield organisation
I supervised a Year 12 student for a 2-week placement working on MeerKAT single dish data.

Teaching Assistant 2020-2021
First year tutorial sessions for Department of Physics and Astronomy, University of Manchester.
Courses covered by tutorial session: PHYS10071 Mathematics 1; PHYS10191 Introduction to Astrophysics and Cosmology; PHYS10352 Properties of Matter; PHYS10372 Mathematics 2.

Teaching Assistant Fall 2019
Space and Time (introductory gravitational physics), Department of Astronomy, USTC

Research Intern 2018–2019
National Astronomical Observatories of China, Chinese Academy of Science
Supervisor: Prof. Xuelei Chen

Research Assistant 2017–2019
CAS Key Laboratory for Research in Galaxy and Cosmology, USTC
Supervisor: Prof. Yi-Fu Cai

Publications

1. **Z. Chen**, E. Chapman, L. Wolz and A. Mazumder, "Detecting the HI Power Spectrum in the Post-Reionization Universe with SKA-Low", *submitted to MNRAS*. arXiv: 2302.11504
2. S. Paul, M. G. Santos, **Z. Chen (corresponding author)** and L. Wolz, "A first detection of neutral hydrogen intensity mapping on Mpc scales at $z \approx 0.32$ and $z \approx 0.44$", *submitted to ApJ letters*. arXiv: 2301.11943
3. **Z. Chen**, L. Wolz and R. Battye, "Towards Optimal Foreground Mitigation Strategies for Interferometric HI Intensity Mapping in the Low-Redshift Universe", *Mon.Not.Roy.Astron.Soc.* 518 (2023) 2, 2971–2990. arXiv: 2205.07776
4. **Z. Chen**, L. Wolz, M. Spinelli and S. G. Murray, "Extracting HI Astrophysics from Interferometric Intensity Mapping", *Mon.Not.Roy.Astron.Soc.* 502 (2021) 4, 5259–5276. arXiv: 2010.07985
5. S. G. Murray, B. Diemer, **Z. Chen** et al., "TheHaloMod: An online calculator for the halo model", *Astron.Comput.* 36 (2021) 100487. arXiv: 2009.14066

6. **Z. Chen**, W. Luo, Y.-F. Cai, and E. Saridakis, "New test on general relativity and $f(T)$ torsional gravity from galaxy-galaxy weak lensing surveys", *Phys. Rev. D* 102 (2020), 104044. arXiv: 1907.12225

7. B. Li, **Z. Chen**, Y.-F. Cai, and Y. Mao, "Testing the scale-dependent hemispherical asymmetry with the 21-cm power spectrum from the epoch of reionization", *Mon.Not.Roy.Astron.Soc.* 487 (2019) 4, 5564-5571. arXiv: 1904.04683

8. **Z. Chen**, Y. Xu, Y. Wang and X. Chen, "Stages of Reionization as revealed by the Minkowski Functionals", *Astrophys.J.* 885 (2019) 23. arXiv: 1812.10333

Academic Service

- **Organiser of JBCA cosmology lunch seminar** 2021-
- **Organiser of JBCA intensity mapping journal club** 2021-2022
- **Referee for Monthly Notices of the Royal Astronomical Society** 2022-

Talks

SKAO Cosmology Science Working Group meeting 2023 01/2023
Title: A first detection of neutral hydrogen intensity mapping on Mpc scales at $z \approx 0.32$ and $z \approx 0.44$ JBCA

HITS (HI Intensity Mapping in Trieste) 2022 05/2022
Title: Interferometric Intensity Mapping SISSA Trieste

ETH astronomy (invited) 04/2022
Title: Interferometric Intensity Mapping IPA, ETH Zurich

SAZERAC 21cm 2022 03/2022
Title: Interferometric Intensity Mapping in the Low-Redshift Universe Online

UK National Astronomy Meeting 2021 07/2021
Title: Extracting HI Astrophysics from Interferometric Intensity Mapping University of Bath

2021 SKA Science Conference 03/2021
Title: Extracting HI Astrophysics from Interferometric Intensity Mapping SKA Organisation

SWIFAR Colloquium (invited) 09/2020
Title: Halo Model, Interferometric Intensity Mapping and HI Shot Noise Yunnan University

Research Interests

Interferometric Intensity Mapping with MeerKAT
I am a leading member of the MeerKAT interferometric intensity mapping group.
I am also a member of the MeerKLASS collaboration working on single dish intensity mapping.

Cosmology with Square Kilometre Array Observatory
I am a member of the SKAO cosmology science working group working on SKA-low simulations.

Astrophysical Computing
I worked on development of `halomod`. Currently I am working on the MIGHTEE intensity mapping pipeline.

Skills

- **Programming Language:** Python, C, Mathematica
- **Software:** Git, CASA, OSKAR, PyTorch, OpenMPI, emcee