Ma, Hai-Xia

Division of Particle and Astrophysical Science, Nagoya University,
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Research Interests

Galactic Dynamics; Galaxy Formation and Evolution; Dark Matter; Axion; Milky Way Structure

Education & Appointments

Nagoya University   *Nagoya, Japan*
DOCTOR OF SCIENCE   *Oct. 2022 - present*
- Advisor: Prof. Tsutomu T. Takeuchi

Nagoya University   *Nagoya, Japan*
MASTER OF SCIENCE   *Oct. 2020 - Sep. 2022*
- Advisor: Prof. Tsutomu T. Takeuchi
- thesis: *Understanding the Origin of Multi-Scale Mass Distribution in the Universe: from Stars to Galaxies*

University of Science and Technology of China   *Hefei, China*
BACHELOR OF ASTRONOMY   *Sep. 2015 - Jun. 2019*
- Advisor: Prof. Xiao-Bo Dong
- thesis: *Tests of Gravity Theories in the Andromeda Galaxy.*

Professional Experience

Yunnan Observatories, Chinese Academy of Sciences   *Yunnan, China*
RESEARCH ASSISTANT   *Jul. 2019 - Sep. 2020*
- Advisor: Prof. Xiao-Bo Dong

Publications

FIRST-AUTHOR:

○ **Ma, H.-X.**; Takeuchi, T. T.; Cooray, S.; and Zhu, Y.; 2024. *"Density-based clustering algorithm for galaxy group/cluster identification"*. arXiv e-prints, arXiv:2405.09855

○ Zhu, Y.*; **Ma, H.-X.* (*co-first author)**; Dong, X.-B.; Huang, Y.; Mistele, T., Peng; B., Long, Q.; Wang, T.; Chang L.; and Jin X.; 2023. *"How Close Dark Matter Halos and MOND Are to Each Other: Three-Dimensional Tests Based on Gaia DR2"*. MNRAS, 519, 4479

CO-AUTHOR:

○ Zhu, Y.; Bakx, T.; Ikeda, R.; Umehata, H.; Becker, G. D.; Cain, C.; Champagne, J. B.; Fan, X.; Fudamoto, Y.; Jin, X.; **Ma, H.-X.**; Sun, Y.; Takeuchi, T. T.; and Tee, W. L.; 2024. *"Discovery of a Unique Close Quasar-DSFG Pair Linked by a [C II] Bridge at z = 5.63"*. arXiv e-prints, arXiv:2411.06698

○ Cooray, S.; Takeuchi, T. T.; Kashino, D.; Yoshida, S. A.; **Ma, H.-X.**; K. T.; 2023 *"Galaxy Manifold: Characterizing and understanding galaxies with two parameters"*. MNRAS, 524, 4, 4976

○ Zhu, Y.; Becker, G.D.; Christenson, H.M.; D'Aloisio, A.; Bosman, S.E.I.; Bakx, T.; D'Odorico, V.; Bischetti, M.; Cain, C.; Davies, F.B.; Davies, R.L.; Eilers, A.-C.; Fan, X.; Gaikwad, P.; Haehnelt, M.G.; Keating, L.C.; Kulkarni, G.; Lai, S.; **Ma, H.-X.**; Mesinger, A.; Qin, Y.; Satyavolu, S.; Takeuchi, T.T.; Umehata, H.; and

Yang, J.; 2023. *"Probing Ultra-late Reionization: Direct Mea- surements of the Mean Free Path over 5 < z < 6".* The Astrophysical Journal, 955, 115

Awards, Fellowships, & Grants

2024	**THERS Make New Standards Program for the Next Generation Researchers Fellowship**, Nagoya University	*3,740,000 JPY*
2018	**Student PI of Innovation Training Programs for Undergraduate**, Chinese Academy of Sciences	*20,000 CNY*
2018	**Outstanding Student Scholarship**, University of Science and Technology of China	*2,000 CNY*
2015	**Outstanding Student Scholarship**, University of Science and Technology of China	*2,000 CNY*

Presentations

Conference / Seminar

Nov. 2024	*Addressing the Crises of the ⧸CDM Model on Galactic Scales.* Oral Presentation: First Star First Galaxy Workshop.	*Nagano, Japan*
Oct. 2024	*A Slightly Oblate Dark Matter Halo with a Core-like Inner Density Profile Revealed by Fine-Stratified Stellar Populations from Gaia DR3.* Oral Presentation: Kashiwa-no-ha Dark Matter and Cosmology Symposium.	*Tokyo, Japan*
Oct. 2024	*Couplings between dark matter and baryonic matter on galactic scales in Gaia DR3.* Oral Presentation: COSMO'24.	*Kyoto, Japan*
Oct. 2024	*Unveiling the Shape of the Milky Way's Dark Matter Halo: Resolving the Small-Scale Challenges of CDM.* Talk at NAOJ Subaru Telescope Group.	*Tokyo, Japan*
Sep. 2024	*Density-based clustering algorithm for galaxy group/cluster identification.* Poster: First Results from the SRG/eROSITA All-Sky Survey: From Stars to Cosmology.	*Garching, Germany*
Jul. 2023	*Investigating the Temporal Evolution of Large-Scale Structure in the Universe via Topological Approaches.* Poster: TDA Week 2023.	*Kyoto, Japan*
Jun. 2023	*Couplings between dark matter and baryonic matter on galactic scales: the radial vs. vertical.* Oral Presentation: Celebrating 40 years of Milgromian dynamics and charting the road ahead.	*St Andrews, UK*
Feb. 2023	*Galaxy Cluster and Group Finding via Unsupervised Clustering.* Oral Presentation: 9th Galaxy Evolution Workshop.	*Kyoto, Japan*
Feb. 2022	*Cluster Finding via Unsupervised Machine Learning.* Poster: 8th Galaxy Evolution Workshop.	*Online*
Feb. 2022	*Discriminating Gravitational Potential Models on Galactic Scales.* Oral Presentation Spring Annual Meeting of ASJ.	*Online*
Feb. 2021	**Tests of MOND and CDM on Galactic-scale.** Poster: 7th Galaxy Evolution Workshop.	*Online*

Teaching Experience

Fall 2018	**Introduction to Astronomy**, Teaching Assistant	*USTC*