Zhongxu Zhai

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Research Areas

Large-scale Structure, Galaxy Clustering, Dark matter & Dark energy, Cosmic Microwave Background, Cosmological Simulations, Statistical Inferences, Galaxy Formation and Evolution

Appointment

Postdoctoral Scholar; Caltech/IPAC, 8/2018 - present
Advisor: Yun Wang

Education

Ph.D., Physics, New York University, Sept. 2013- May. 2018.
   Advisor: Michael Blanton, Jeremy Tinker

M.S., Physics, Beijing Normal University, Sept. 2010- Jul. 2013.

B.S., Physics, Beijing Normal University, Sept. 2006-Jul. 2010.

Teaching Experience

2014-2015, Teaching Assistant, Department of Physics, New York University

   Course: Einstein's Universe; Sound and Music; General Physics

2011, Teaching Assistant, Department of Physics, Beijing Normal University

   Course: General Relativity

Awards

2016-2018: James Arthur Graduate Award, CCPP, NYU

2013-2016: Henry M. MacCracken Fellowship, NYU

2013: Outstanding Graduate of the City of Beijing

2012: National Scholarship for Graduate Student

Presentation/Seminar/Conference

08/2020, talk at GISS2020, Caltech/IPAC

03/2020, seminar talk at Caltech/IPAC

01/2020, poster and spotlight talk, BCCP workshop, UC Berkeley

6/2019, seminar talk at KIPAC, Stanford University, CA

5/2019, workshop: Emulation of Galaxy Clustering, CCAPP, OSU, OH

5/2019, talk at the youth forum of Nanjing University, China

10/2018, ATLAS workshop, Caltech

07/2018, seminar talk at Nanjing University

02/2018, talk at eBOSS Collaboration Meeting, Munich, Germany

01/2018, talk at Modeling the Extragalactic Sky meeting, UC Berkeley, CA

12/2017, seminar talk at CCAPP, Ohio State University, OH

04/2017, Massive Neutrino Workshop, Math for America, NY

08/2016, Boss Lunch Talk, Lawrence Berkeley National Laboratory, CA

06/2013, Annual meeting of Division of Gravitation and Relativistic Astrophysics of the Chinese Physical society, Guangzhou, Guangdong

08/2011, Annual meeting of Division of Gravitation and Relativistic Astrophysics of the Chinese Physical society, Datong, Shanxi

Grant/Proposal/Computing

PI, 1,000,000 CPU hours, 20 TB storage on XSEDE/Comet (TG-AST180059, 12/2018-12/2019)

PI, 681,000 CPU hours, 8 TB storage on XSEDE/Comet (TG-AST180059, 12/2019-12/2020)

Community Service

Referee for ApJ, MNRAS, ApSS

Students Mentoring/Outreach

Research mentor of Freshman Summer Research Institute (FSRI) 2020 at Caltech

Gilbert Castro, undergraduate at Caltech

Publications

[23] Zhongxu Zhai et. al., *Clustering in the Simulated Hα Galaxy Redshift Survey from Nancy Grace Roman Space Telescope*, arXiv: 2008.09746

[22] Zhongxu Zhai, Yun Wang & Dan Scolnic, *Forecasting Cosmological Constraints from the Weak Lensing Magnification of Type Ia Supernovae Measured by the Nancy Grace Roman Space Telescope*, PRD accepted, arXiv: 2008.06804

[21] Zhongxu Zhai et. al., *CMB distance priors revisited: effects of dark energy dynamics, spatial curvature, primordial power spectrum, and neutrino parameters*, JCAP 07 (2020) 009, arXiv: 1912.04921

[20] Thomas McClintock et. al., *The Aemulus Project IV: Emulating Halo Bias* , arXiv: 1907.13167

[19] Zhongxu Zhai et. al., *Prediction of Hα and [OIII] Emission Line Galaxy Number Counts for Future Galaxy Redshift Surveys* , Mon.Not.Roy.Astron.Soc. 490 (2019) 3, arXiv: 1907.09680

[18] Zhongxu Zhai & Yun Wang, *Reconstructing the weak lensing magnification distribution of Type Ia supernovae*, PRD, **8**, 083525 (2019) arXiv:1901.08175

[17] Zhongxu Zhai & Yun Wang, *Robust and model-independent cosmological constraints from distance measurements*, JCAP, **07**, 005 (2019), arXiv:1811.07425

[16] Zhongxu Zhai et. al., *Aemulus Project III: Emulation of the galaxy correlation function*, ApJ, **874**, 95 (2019) arXiv: 1804.05867

[15] Thomas McClintock et. al., *The Aemulus Project II: Emulating the Halo Mass Function*, ApJ, **872**, 53 (2019) arXiv: 1804.05866

[14] Joseph DeRose et. al., *The Aemulus Project I: Numerical Simulations for Precision Cosmology*, ApJ, **875**, 69 (2019), arXiv: 1804.04865

[13] Julian E. Bautista et. al., *The SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations at redshift of 0.72 with the DR14 Luminous Red Galaxy Sample*, ApJ, **863**, 110 (2018) [arXiv: 1712.08064]

[12] Zhongxu Zhai & Michael Blanton, *A forecast for the detection of the power asymmetry from galaxy surveys*, ApJ, **850**, 41 (2017) [arXiv:1707.06555]

[11] Zhongxu Zhai et. al., *An evaluation of cosmological models from expansion and growth of structure measurements*, ApJ, **850**, 183 (2017) [arXiv:1705.10031]

[10] Zhongxu Zhai et. al., *The clustering of luminous red galaxies at $z \sim 0.7$ from eBOSS and BOSS data*, ApJ, **848**, 76 (2017) [arXiv:1607.05383]

[9] Shadab Alam et. al., *The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: cosmological analysis of the DR12 galaxy sample*, Mon. Not. Roy. Astron. Soc. **470**, no.3, 2617-2652 (2017) [arXiv:1607.03155]

[8] Kyle S. Dawson et. al., *The SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Overview and Early Data*, Astron. J. **151**, 44 (2016) [arXiv:1508.04473]

[7] Zhong-Xu Zhai, Ming-Jian Zhang, Zhi-Song Zhang, Xian-Ming Liu, Tong-Jie Zhang, *Reconstruction and constraining of the jerk parameter from OHD and SNe Ia observations*, Phys. Lett. B **727**, 8 (2013) [arXiv:1303.1620]

[6] Ming-Jian Zhang, Cong Ma, Zhi-Song Zhang, **Zhong-Xu Zhai**, and Tong-Jie Zhang, *Cosmological constraints on holographic dark energy models under the energy conditions* Phys. Rev. D **88**, 063534 (2013)

[5] Zhong-Xu Zhai, Xian-Ming Liu, Zhi-Song Zhang, Tong-Jie Zhang, *Estimations of the cosmological parameters from the observational variation of the fine structure constant*, Res. Astron. Astrophys. **13** 1423 (2013), [arXiv:1207.2926]

[4] Xian-Ming Liu, **Zhong-Xu Zhai**, Kui Xiao, Wen-Biao Liu, *The accelerated scaling attractor solution of the interacting agegraphic dark energy in Brans-Dicke theory*, Eur. Phys. J. C **72**, 2057 (2012) [arXiv:1206.1911]

[3] Zhong-Xu Zhai, Tong-Jie Zhang, Wen-Biao Liu, *Constraints on Λ(t) CDM models as holographic and agegraphic dark energy with the observational Hubble parameter data*, JCAP, **08**, 019 (2011), [arXiv:1109.1661]

[2] Zhong-Xu Zhai, Hao-Yi Wan, Tong-Jie Zhang, *Cosmological constraints from radial baryon acoustic oscillation measurements and observational Hubble data*, Phys. Lett. B **689**, 8 (2010), [arXiv:1004.2599].

[1] Zhong-Xu Zhai, Wen-Biao Liu, *Nernst theorem and Hawking radiation from a Reissner-Nordstrom black hole*, Astrophys. Space Sci. **325**, 63 (2010)

References

Dr. Andrew Benson, Carnegie Observatories,   abenson@carnegiescience.edu
Prof. Michael R. Blanton, CCPP, New York University   blanton@nyu.edu
Prof. Jeremy L. Tinker, CCPP, New York University   jlt12@nyu.edu
Dr. Yun Wang, Caltech/IPAC   wang@ipac.caltech.edu