CHUN-HAO TO

CONTACT

Department of Physics,
Stanford University
382 Via Pueblo Mall, Stanford, CA 94025, USA

E-Mail: chto@stanford.edu
Phone: +1-702-235-8760
Webpage: chunhaoto.com

RESEARCH INTERESTS

Observational and Computational cosmology
Cluster abundance cosmology, Large-scale structure, Combined-probe analyses, Galaxy–halo connection

EDUCATION

Ph.D in Physics   *2016–Present*
Department of Physics, Stanford University, CA, USA
B.S. in Physics   *2011–2015*
Department of Physics, National Taiwan University, Taipei, Taiwan

AWARDS

- Dark Energy Survey builder status (for 2 FTE years of infrastructure work)   *2020*

- Dark Energy Survey Early Career Scientist   *2019*
  Awarded US$1500 for participating in 2 DES Collaboration Meetings

- Dean's Award of College of Science, National Taiwan University   *2015*

- Stanford CS230/Deep Learning, Project Award:
  Efficient Neural Network Implementation of the UniverseMachine; Awarded US$400 AWS credit

SCIENTIFIC COLLABORATION

- Dark Energy Survey (DES)

  - Active member of Cluster, Simulation, Theory and combined-probes, and Weak lensing working groups

  - Internal reviewer for Y3 galaxy–galaxy lensing paper

TEACHING AND OUTREACH

- The Origin and Development of the Cosmos   *Winter 2020*

- Astronomy Laboratory and Observational Astronomy   *Fall 2018*

- Electricity and Magnetism Lab   *Spring 2017*

- Teacher, Stanford ESP Splash! Program   *Spring 2017*

MENTORING EXPERIENCE

- Kathlynn Simotas, undergrad student at Stanford, Quantifying redMaPPer cluster systematics using galaxies with spectroscopic redshifts, 2019–ongoing

PUBLICATIONS – LEAD AUTHOR

ADS full list* (See a complete list at the end)

1. **To, C.-H.**, Krause, E., Rozo, E., et al. 2020, "Dark Energy Survey Year 1 Results: Cosmological Constraints from Cluster Abundances, Weak Lensing, and Galaxy Correlations", *arXiv e-prints*, arXiv:2010.01138, reviewed by the DES collaboration, submitted to PRL.

2. **To, C.-H.**, Krause, E., Rozo, E., et al. 2020, "Combination of cluster number counts and two-point correlations: Validation on Mock Dark Energy Survey", *arXiv e-prints*, arXiv:2008.10757, reviewed by the DES collaboration, submitted to MN-RAS.

3. **To, C.-H.**, Reddick, R. M., Rozo, E., Rykoff, E., & Wechsler, R. H. 2020, "RedMaP-Per: Evolution and Mass Dependence of the Conditional Luminosity Functions of Red Galaxies in Galaxy Clusters", *The Astrophysical Journal*, 897, 15

4. **To, C.-H.**, Wang, W.-H., & Owen, F. N. 2014, "Star Formation Rate and Extinction in Faint z ~4 Lyman Break Galaxies", *The Astrophysical Journal*, 792, 139

PROGRAMMING SKILLS

Extensive experiences on Python, Pytorch, C/C++, and IDL

PRESENTATIONS

* Invited Presentations

2020	Survey science group meeting, University of Chicago	*Nov*
	*Gravitational lensing group seminar, LMU	*Nov*
	*Seminar at Stony Brook University	*Nov*
	*Dark Sector Meeting, JPL	*Oct*
	Cosmology Lunch, Princeton University	*Oct*
	Cosmic surveys meeting, Fermilab	*Oct*
	*CCAPP Seminar, OSU	*Oct*
	*Cosmology Seminar, University of California, Berkeley	*Sep*
	*11th CMB-S4 Workshop: Cosmology and Astrophysics in the Next Decade	*Aug*
	Cosmology from Home	*Aug*
	Dark Energy Survey Virtual Collaboration Meeting	*May*
2019	Dark Energy Survey Collaboration Meeting	*Nov*

	• Cosmic Controversies	*Sep*
	• Great Lake Cosmology Workshop	*Aug*
	• Dark Energy Survey Collaboration Meeting	*May*
	• Panchromatic Panoramic Studies of Galaxy Clusters	*March*
2018	• Dark Energy Survey Y3KP workshop	*Oct*
	• Tucson DECaLS Workshop	*Aug*
	• Santa Cruz Galaxy Workshop	*Aug*

REFERENCES

- Risa H. Wechsler   Email: rwechsler@stanford.edu
Physics Department, Stanford University
Stanford, CA 94305, USA

- Eduardo Rozo   Email: erozo@email.arizona.edu
Department of Physics, University of Arizona
Tucson, AZ 85721, USA

- Elisabeth Krause   Email: krausee@email.arizona.edu
Steward Observatory
Department of Astronomy, University of Arizona
Tucson, AZ 85721, USA

- Daniel Gruen   Email: dgruen@stanford.edu
KIPAC / SLAC, Fred Kavli Building
Menlo Park, CA 94025, USA

- Eli Rykoff   Email: erykoff@slac.stanford.edu
KIPAC / SLAC, Fred Kavli Building
Menlo Park, CA 94025, USA

LIST OF PUBLICATIONS

1. Costanzi, M., Saro, A., Bocquet, S., et al. 2020, "Cosmological Constraints from DES Y1 Cluster Abundances and SPT Multi-wavelength data", *arXiv e-prints*, arXiv:2010.13800

2. Fortino, W. F., Bernstein, G. M., Bernardinelli, P. H., et al. 2020, "Reducing ground-based astrometric errors with Gaia and Gaussian processes", *arXiv e-prints*, arXiv:2010.13742

3. Muir, J., Baxter, E., Miranda, V., et al. 2020, "DES Y1 results: Splitting growth and geometry to test ΛCDM", *arXiv e-prints*, arXiv:2010.05924

4. To, C.-H., Krause, E., Rozo, E., et al. 2020, "Dark Energy Survey Year 1 Results: Cosmological Constraints from Cluster Abundances, Weak Lensing, and Galaxy Correlations", *arXiv e-prints*, arXiv:2010.01138, reviewed by the DES collaboration, submitted to PRL.

5. Henghes, B., Lahav, O., Gerdes, D. W., et al. 2020, "Machine Learning for Searching the Dark Energy Survey for Trans-Neptunian Objects", *arXiv e-prints*, arXiv:2009.12856

6. Hilton, M., Sifón, C., Naess, S., et al. 2020, "The Atacama Cosmology Telescope: A Catalog of > 4000 Sunyaev-Zel'dovich Galaxy Clusters", *arXiv e-prints*, arXiv:2009.11043

7. Kelsey, L., Sullivan, M., Smith, M., et al. 2020, "The Effect of Environment on Type Ia Supernovae in the Dark Energy Survey Three-Year Cosmological Sample", *arXiv e-prints*, arXiv:2008.12101

8. Adhikari, S., Shin, T.-. hyeon ., Jain, B., et al. 2020, "Probing galaxy evolution in massive clusters using ACT and DES: splashback as a cosmic clock", *arXiv e-prints*, arXiv:2008.11663

9. To, C.-H., Krause, E., Rozo, E., et al. 2020, "Combination of cluster number counts and two-point correlations: Validation on Mock Dark Energy Survey", *arXiv e-prints*, arXiv:2008.10757, reviewed by the DES collaboration, submitted to MNRAS.

10. Aguena, M., Benoist, C., da Costa, L. N., et al. 2020, "The WaZP galaxy cluster sample of the Dark Energy Survey Year 1", *arXiv e-prints*, arXiv:2008.08711

11. Abbott, T. M. C., Aguena, M., Alarcon, A., et al. 2020, "Dark Energy Survey Year 1 Results: Cosmological constraints from cluster abundances and weak lensing", *Physical Review D*, 102, 023509

12. To, C.-H., Reddick, R. M., Rozo, E., Rykoff, E., & Wechsler, R. H. 2020, "RedMaP-Per: Evolution and Mass Dependence of the Conditional Luminosity Functions of Red Galaxies in Galaxy Clusters", *The Astrophysical Journal*, 897, 15

13. Korytov, D., Hearin, A., Kovacs, E., et al. 2019, "CosmoDC2: A Synthetic Sky Catalog for Dark Energy Science with LSST", *The Astrophysical Journal Supplement Series*, 245, 26

14. Chuang, C.-H., Yepes, G., Kitaura, F.-S., et al. 2019, "UNIT project: Universe N-body simulations for the Investigation of Theoretical models from galaxy surveys", *Monthly Notices of the Royal Astronomical Society*, 487, 48

15. Zhang, Y., Yanny, B., Palmese, A., et al. 2019, "Dark Energy Survey Year 1 Results: Detection of Intracluster Light at Redshift ~ 0.25", *The Astrophysical Journal*, 874, 165

16. To, C.-H., Wang, W.-H., & Owen, F. N. 2014, "Star Formation Rate and Extinction in Faint z ~4 Lyman Break Galaxies", *The Astrophysical Journal*, 792, 139