

CHUN-HAO TO

CONTACT

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RESEARCH INTERESTS

Observational and Computational cosmology

Cluster cosmology, Weak gravitational lensing, Large-scale structure, Combined-probe analyses, Galaxy–halo connection

EMPLOYMENT

CCAPP postdoctoral Fellow, Ohio State University *2021–Present*

EDUCATION

Ph.D in Physics *2016–2021*

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*

SCIENCE LEADERSHIP

- Co-convenor of DES cluster working group (2024–)
- Analysis Co-lead of cluster cosmology key projects of DES (2021–2023)

SERVICE

- Referee of MNRAS and A&A, since 2021.
- Organizer of Cosmolunch at OSU, since 2021.
- Internal referee of DES, since 2020.

TEACHING AND OUTREACH

- Public talk at Bexley library:
”Simulating the Universe with Supercomputers” *Summer 2023*
”Learning the dark universe with galaxies and galaxy clusters” *Summer 2022*

- Guest lecturer at Astronomy 2895 Topics in Astrophysics *Fall 2021*
- 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 (past), UCSB graduate student, Quantifying redMaPPer cluster systematics using galaxies with spectroscopic redshifts, 2019–2021
- Nihar Dalal, graduate student at Ohio State University, Cluster cosmology with ACT and DES, 2023–

PUBLICATIONS

128 refereed publications with a total of 4709 citations (1396 citations in refereed Journals), h-index=36 according to NASA/ADS Metrics Summary.

First author publications:

1. **To, C.-H.**, Pandey, S., Krause, E., Dalal, N., Anbajagane, D., & Weinberg, D. H. 2024, “Deciphering baryonic feedback with galaxy clusters”, *arXiv e-prints*, arXiv:2402.00110
2. **To, C.-H.**, DeRose, J., Wechsler, R. H., et al. 2024, “Buzzard to Cardinal: Improved Mock Catalogs for Large Galaxy Surveys”, *The Astrophysical Journal*, 961, 59
3. **To, C.-H.**, Rozo, E., Krause, E., Wu, H.-Y., Wechsler, R. H., & Salcedo, A. N. 2023, “LINNA: Likelihood Inference Neural Network Accelerator”, *Journal of Cosmology and Astroparticle Physics*, 2023, 016
4. **To, C.-H.**, Krause, E., Rozo, E., et al. 2021, “Dark Energy Survey Year 1 Results: Cosmological Constraints from Cluster Abundances, Weak Lensing, and Galaxy Correlations”, *Physical Review Letters*, 126, 141301
5. **To, C.-H.**, Krause, E., Rozo, E., et al. 2021, “Combination of cluster number counts and two-point correlations: validation on mock Dark Energy Survey”, *Monthly Notices of the Royal Astronomical Society*, 502, 4093
6. **To, C.-H.**, Reddick, R. M., Rozo, E., Rykoff, E., & Wechsler, R. H. 2020, “RedMaPPer: Evolution and Mass Dependence of the Conditional Luminosity Functions of Red Galaxies in Galaxy Clusters”, *The Astrophysical Journal*, 897, 15
7. **To, C.-H.**, Wang, W.-H., & Owen, F. N. 2014, “Star Formation Rate and Extinction in Faint $z \sim 4$ Lyman Break Galaxies”, *The Astrophysical Journal*, 792, 139

PROGRAMMING SKILLS

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

Public Software: <https://github.com/chto/linna>

Public Webpage: <https://chunhaoto.com/cardinalsim/>

PRESENTATIONS

* Invited Presentations

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| 2023 | • *Cosmology Astrophysics Seminar at University of Michigan | <i>Nov</i> |
| | • Plenary talk at Dark Energy Survey Collaboration Meeting | <i>Oct</i> |
| | • Groups and Clusters of Galaxies at the Crossroad between Astrophysics and Cosmology at Aspen | <i>Aug</i> |
| | • *CMB-S4 Workshop | <i>Aug</i> |
| 2022 | • ICML International Conference on Machine Learning | <i>July</i> |
| | • Plenary talk at Dark Energy Survey Collaboration Meeting | <i>May</i> |
| | • *Colloquium, LMU | <i>May</i> |
| | • Colloquium, ASIAA | <i>May</i> |
| | • Advances in Cosmology through Numerical Simulations | <i>May</i> |
| | • Galaxy Clusters 2022: Challenging Our Cosmological Perspectives | <i>April</i> |
| 2021 | • Cluster Mass 2020 | <i>Sep</i> |
| | • Colloquium, ASIAA | <i>Jan</i> |
| 2020 | • Survey science group meeting, University of Chicago | <i>Nov</i> |
| | • *Gravitational lensing group seminar, LMU | <i>Nov</i> |
| | • *Seminar at Stony Brook University | <i>Nov</i> |
| | • *Dark Sector Meeting, JPL | <i>Oct</i> |
| | • Cosmology Lunch, Princeton University | <i>Oct</i> |
| | • Cosmic surveys meeting, Fermilab | <i>Oct</i> |
| | • *CCAPP Seminar, OSU | <i>Oct</i> |
| | • *Cosmology Seminar, University of California, Berkeley | <i>Sep</i> |
| | • *11th CMB-S4 Workshop: Cosmology and Astrophysics in the Next Decade | <i>Aug</i> |
| | • Cosmology from Home | <i>Aug</i> |
| | • Dark Energy Survey Virtual Collaboration Meeting | <i>May</i> |
| 2019 | • Dark Energy Survey Collaboration Meeting | <i>Nov</i> |
| | • Cosmic Controversies | <i>Sep</i> |

- 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

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