

# ZHOU, CONGHAO

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## CONTACT

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## RESEARCH INTERESTS

dark matter · gravitational lensing · galaxy clusters · large scale structure  
shear calibration · image simulation

## EDUCATION

	University of California, Santa Cruz
2020 - Present	Ph.D. in Physics
2021 on Leave	Physics Department
	Thesis: <i>TBD</i>
	Committee: TESLA E. JELTEMA, ALEXIE S. LEAUTHAUD
	Duke University
2020	B.A. in Physics with Highest Distinction
	Department of Physics
	Thesis: <i>Intrinsic Alignment of redMaPPer Clusters in the Dark Energy Survey</i>
	Committee: MICHAEL A. TROXEL, CHRISTOPHER W. WALTER, ROBERT L. WOLPERT

## LEAD PUBLICATION

1. Constraining optical selection effect with DES and SPT, in prep.  
C. ZHOU, S. GRANDIS, H.Y. WU, A.N. SALCEDO et al.
2. Analytical Shear Calibration for Galaxy Clusters  
C. ZHOU, X. LI et al.
3. Resposne bias in shear calibration, in prep.  
C. ZHOU, M.R. BECKER, M. GATTI et al.
4. Relationship between 2D and 3D Galaxy Stellar Mass and Correlations with Halo Mass, [arXiv](#)  
C. ZHOU, A.S. LEAUTHAUD, S. XU., B. DIEMER, S. HUANG, et al.
5. Forecasting the constraints on optical selection bias and projection effects of galaxy cluster lensing with multiwavelength data, [PRD](#)  
C. ZHOU, H.Y WU, A.N. SALCEDO, S. GRANDIS, T.E. JELTEMA, A.S. LEAUTHAUD et al.
6. The intrinsic alignment of red galaxies in DES Y1 redMaPPer galaxy clusters , [MNRAS](#)  
C. ZHOU, A. TONG, M.A. TROXEL, J. BLAZEK, C. LIN et al.

## CONTRIBUTED PUBLICATION

1. The Outskirt Stellar Mass of Low-Redshift Massive Galaxies is an Excellent Halo Mass Proxy in Illustris/IllustrisTNG Simulations , [arXiv](#)  
S. XU et al.

2. Improving Galaxy Cluster Selection with the Outskirt Stellar Mass of Galaxies , [arXiv](#)  
M.KWIECIEN et al.
3. Optical galaxy cluster mock catalogs with realistic projection effects: validations with the SDSS redMaPPer clusters , [arXiv](#)  
A. LEE et al.
4. Building an Efficient Cluster Cosmology Software Package for Modeling Cluster Counts and Lensing , [arXiv](#)  
M. AGUENA et al.
5. Dark Energy Survey Year 3 results: Simulation-based cosmological inference with wavelet harmonics, scattering transforms, and moments of weak lensing mass maps. Validation on simulations , [PRD](#)  
M. GATTI et al.
6. Dark Energy Survey Year 3 Results: Deep Field Optical + Near-Infrared Images and Catalogue , [MNRAS](#)  
W.G. HARTLEY, A. CHOI, A. AMON et al.

#### TALKS

<i>dec. 2024</i>	Theoretical Astrophysics and Cosmology Seminar, University of Arizona
<i>nov. 2024</i>	Cosmology Seminar, UC Davis
<i>apr. 2024</i>	CMB S <sub>4</sub> Cluster AWG Meeting
<i>mar. 2024</i>	Center for the Fundamental Physics of the Universe Seminar, Brown University
<i>mar. 2024</i>	Journal Club, University of Pennsylvania
<i>oct. 2023</i>	Cosmology Seminar, Tsinghua University
<i>oct. 2023</i>	Joint Stony Brook University / Brookhaven National Lab Cosmology Seminar

#### OBSERVING EXPERIENCE

<i>7 effective nights</i>	Dark Energy Spectroscopic Instrument, Mayall 4m at Kitt Peak
<i>3 nights</i>	DeCaLS Intermediate Band Imaging Survey, Blanco 4m at CTIO

#### PROFESSIONAL MEMBERSHIP

<i>2024 - Present</i>	Full Member, LSST Dark Energy Science Collaboration
<i>2024 - Present</i>	Student Member, American Astronomical Society
<i>2024 - Present</i>	Student Member, American Physical Society
<i>2023 - Present</i>	Member, LSST Galaxy Science Collaboration
<i>2023 - Present</i>	Member, LSST Informatics & Statistics Science Collaboration
<i>2020 - Present</i>	Student Member, Dark Energy Spectroscopic Instrument
<i>2020 - 2024</i>	Member, LSST Dark Energy Science Collaboration
<i>2018 - Present</i>	Student Member, Dark Energy Survey

#### OUTREACH

<i>2023 - 2024</i>	Starlight Over Street Light
<i>2022</i>	UC Santa Cruz Physics Outreach Taskforce
<i>2022</i>	Science Internship Program Mentor
<i>2022</i>	UC Santa Cruz Physics Mentoring Program Mentor

#### PROFESSIONAL SERVICE

<i>2025 Winter</i>	UC Santa Cruz Physics Colloquium Committee
<i>2024 - present</i>	Referee, Astronomy & Astrophysics
<i>jul.2023-jun.2024</i>	Organizer, BCG Seminar, Boise State
<i>sep.2023-jun.2024</i>	Organizer, CosmoGal Seminar, UC Santa Cruz
<i>jan. 2023</i>	LOC, APS Conference for Undergraduate Women in Physics at UC Santa Cruz
<i>aug. 2022</i>	SOC, LSST DESC 2022 Chicago Meeting
<i>apr. 2022 - present</i>	DES Early Career Scientists Committee
<i>jul. 2022 - present</i>	LSST DESC Mentoring Committee

#### TEACHING

<i>2024 Spring</i>	Application of Quantum Materials (Grader)
<i>2024 Winter</i>	Electricity, Magnetism, and Optics (TA)
<i>2022 Fall</i>	Quantum Mechanics (TA)
<i>2022 Summer</i>	Intermediate Physics Laboratory (TA)
<i>2022 Spring</i>	Advanced Astrophysics Laboratory (TA)
<i>3 times</i>	Introductory Physics Laboratory (TA)

March 1, 2025