

YUN-TING CHENG

California Institute of Technology, M.C. 367-17, 1200 E California Blvd, Pasadena, CA 91125

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EDUCATION

California Institute of Technology

September 2015 - June 2021 (Expected)

Ph.D. in Physics

Advisor: Prof. James J. (Jamie) Bock

California Institute of Technology

September 2015 - June 2019

M.S. in Physics

National Taiwan University

September 2010 - June 2014

B.S. in Physics

RESEARCH INTERESTS

Line Intensity Mapping, Extragalactic Background Light (EBL), Intra-Halo Light (IHL), Data Analysis Techniques in Intensity Mapping, Large-scale Structure (LSS), Epoch of Reionization, Machine Learning

RESEARCH EXPERIENCE

California Institute of Technology

Pasadena, CA

Graduate Research Assistant

September 2015 - Present

Advisor: Prof. James J. (Jamie) Bock

- Cosmic Infrared Background Experiment (CIBER)
 - Studying IHL with CIBER imaging data
 - Building analysis pipeline and characterizing noise and systematic effects for CIBER imagers
- Intensity Mapping
 - Developing techniques to overcome the line blending problem in line intensity mapping
 - Establishing the formalism of optimal mapping strategy for large-scale structure survey
 - Performing the sensitivity forecast of redshift-dependent EBL spectrum for SPHEREx
- Tomographic Ionized Carbon Intensity Mapping Experiment (TIME)
 - Simulating the signals and foregrounds for TIME analysis pipeline
 - Developing foreground mitigation techniques for line intensity mapping
 - Analyzing TIME instrument data

Academia Sinica of Astronomy and Astrophysics (ASIAA)

Taipei, Taiwan

Research Assistant

May 2014 - July 2015

Advisor: Dr. Tzu-Ching Chang

- Developing foreground cleaning technique for line intensity mapping

Summer Student Program

July 2013 - August 2013

Advisor: Dr. Sheng-Yuan Liu, Dr. Yu-Nung Su, Mr. I-Ta Hsieh

- Modeling the starless core with radiative transfer

PUBLICATIONS

For the complete publication list, see my [ADS](#), [Google Scholar](#), and [INSPIRE](#)

First-author papers

- “Phase-Space Spectral Line De-confusion in Intensity Mapping”
Yun-Ting Cheng, Tzu-Ching Chang, James J. Bock
2020, ApJ, 901, 142; arXiv:2005.05341, DOI: 10.3847/1538-4357/abb023
- “Optimally Mapping Large-Scale Structures with Luminous Sources”
Yun-Ting Cheng, Roland de Putter, Tzu-Ching Chang, Olivier Doré
2019, ApJ, 877, 86; arXiv:1809.06384, DOI: 10.3847/1538-4357/ab1b2b
- “Spectral Line De-Confusion in an Intensity Mapping Survey”
Yun-Ting Cheng, Tzu-Ching Chang, James Bock, C. Matt Bradford, Asantha Cooray
2016, ApJ, 832, 165; arXiv:1604.07833

Co-author papers

- “Line-Intensity Mapping: 2017 Status Report”
E. D. Kovetz, M. P. Viero, ..., **Y. T. Cheng**, et al.
arXiv:1709.09066

Manuscripts In Preparation

- “Near Infrared Stellar Halo of Galaxies in CIBER”
Yun-Ting Cheng, et al. (CIBER collaboration)
- “Extragalactic Background Light Spectrum Tomography with SPHEREx”
Yun-Ting Cheng, Tzu-Ching Chang

PRESENTATIONS

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| • UPenn Astronomy Seminar | (virtual) UPenn, PA, Sep, 2020 |
| • Caltech ObsCos Seminar | (virtual) Caltech, CA, Sep, 2020 |
| • CCAT-prime Science Working Group Meeting | (virtual) Cornell, NY, Sep, 2020 |
| • CCA Flatiron Institute Lunch Talk | (virtual) CCA, NY, Sep, 2020 |
| • Caltech ObsCos Seminar | Caltech, CA, Feb, 2020 |
| • L2S2 : Lines in the Large Scale Structure Conference | Marseille, France, Jul, 2019 |
| • Caltech ObsCos Seminar | Caltech, CA, Jun, 2019 |
| • Caltech ObsCos Seminar | Caltech, CA, May, 2019 |
| • 233rd AAS Meeting | Seattle, WA, Jan, 2019 |
| • Taiwanese Theoretical Astrophysics Workshop | ASIAA, Taiwan, Sep, 2018 |
| • ASIAA Seminar | ASIAA, Taiwan, Sep, 2018 |
| • Caltech ObsCos Seminar | Caltech, CA, Jun, 2018 |
| • Cosmological Signals from Cosmic Dawn to the Present | Aspen, CO, Feb, 2018 |
| • Caltech ObsCos Seminar | Caltech, CA, Dec, 2017 |
| • Caltech ObsCos Seminar | Caltech, CA, Nov, 2016 |
| • Caltech ObsCos Seminar | Caltech, CA, Jun, 2016 |
| • Opportunities and Challenges in Intensity Mapping Workshop | KIPAC, CA, Mar, 2016 |
| • ASROC Annual Meeting (Taiwanese Astronomical Society) | Ilan, Taiwan, May, 2015 |
| • ASIAA Summer Student Research Presentation | ASIAA, Taiwan, Aug, 2013 |

POSTERS

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| • Summer School on Large-Scale Structure | Berlin, Germany, Jul, 2018 |
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AWARDS AND HONORS

Taiwan/Caltech Ministry of Education Fellowship
Dean's Award of College of Science, National Taiwan University

Sep 2015 - Aug 2019
Jun 2014

TECHNICAL SKILLS

- Statistical Tools:
Bayesian statistics, Markov Chain Monte Carlo, Fisher analysis, Sparse Reconstruction, Machine Learning (with experience in CNN and Machine Learning Explainability)
- Programming Languages:
Python (Astropy, emcee, Pandas, scikit-learn, TensorFlow, Keras, seabourn), SQL, IDL, Matlab, C++, Fortran, Latex

OUTREACH

Leading physics in-class activities at Gabrielino High School, CA

Jan 2020 - Present