YUN-TING CHENG

California Institute of Technology, M.C. 367-17, 1200 E California Blvd, Pasadena, CA 91125
(+1) 310-227-2817 | ycheng3@caltech.edu | https://yuntingcheng.github.io/

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, Data Analysis, Large-scale Structure, 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 intra-halo light with CIBER images
- Building analysis pipeline and characterizing noise and systematic effects for CIBER imaging data

· 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 signal 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 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"*
Y.-T. Cheng, T.-C. Chang, and J. J. Bock
2020, ApJ, 901, 142; arXiv:2005.05341, DOI: 10.3847/1538-4357/abb023
- *"Optimally Mapping Large-Scale Structures with Luminous Sources"*
Y.-T. Cheng, R. de Putter, T.-C. Chang, and O. Doré
2019, ApJ, 877, 86; arXiv:1809.06384, DOI: 10.3847/1538-4357/ab1b2b
- *"Spectral Line De-Confusion in an Intensity Mapping Survey"*
Y.-T. Cheng, T.-C. Chang, J. J. Bock, C. M. Bradford, and A. R. Cooray
2016, ApJ, 832, 165; arXiv:1604.07833, DOI: 10.3847/0004-637X/832/2/165

Co-author papers

- *"Line-Intensity Mapping: 2017 Status Report"*
  E. D. Kovetz, M. P. Viero, ...,**Y.-T. Cheng**, et al.
  arXiv:1709.09066
- *"A Foreground Masking Strategy for [C ii] Intensity Mapping Experiments Using Galaxies Selected by Stellar Mass and Redshift"*
  G. Sun, L. Moncelsi, M.P. Viero, ..., **Y.-T. Cheng**, et al.
  2018, ApJ, 856, 107; arXiv:1610.10095, DOI: 10.3847/1538-4357/aab3e3

Manuscripts In Preparation

- *"Probing Intra-Halo Light with Galaxy Stacking in CIBER Images"*
  Y.-T. Cheng, et al. (CIBER collaboration)
- *"Extragalactic Background Light Spectrum Tomography with SPHEREx"*
  Y.-T. Cheng, and T.-C. Chang
- *"Super-resolution Reconstruction of Severely Undersampled Point Spread Functions Using Point Source Stacking and Deconvolution"*
  T. Symons, M. Zemcov, ..., **Y.-T. Cheng**, et al.
- *"Rocket Based Measurements of the Zodiacal Light Absolute Intensity through Fraunhofer Absorption Line Spectroscopy"*
  P. M. Korngut, ..., **Y.-T. Cheng**, et al.

PRESENTATIONS

Conference/Seminar Presentations:

• UChicago KICP Seminar	(virtual) Chicago, IL, Jan, 2021
• 237th AAS Meeting	(virtual), Jan, 2021
• Berkeley BCCP Seminar	(virtual) Berkeley, CA, Dec, 2020
• CCA Flatiron Institute Cosmology Group Meeting	(virtual) CCA, NY, Oct, 2020
• OSU CCAPP Seminar	(virtual) OSU, OH, Oct, 2020
• Johns Hopkins U Cosmology/GW Journal Club	(virtual) JHU, MD, Oct, 2020
• 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

Posters:

• Summer School on Large-Scale Structure	Berlin, Germany, Jul, 2018

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
- Instrumentation: SOLIDWORKS, machine shop trained

AWARDS AND HONORS

Taiwan-Caltech Ministry of Education Fellowship — Sep 2015 - Aug 2019
Dean's Award of College of Science, National Taiwan University — Jun 2014

SERVICE AND OUTREACH

237th AAS meeting oral session chair — Jan 2021
233rd AAS meeting poster judge — Jan 2019
Leading physics in-class activities at Gabrielino High School, CA — Jan 2020 - Present

REFERENCES

- **James J. (Jamie) Bock**
  Professor
  jjb@astro.caltch.edu
  California Institute of Technology
  Jet Propulsion Laboratory
- **Tzu-Ching Chang**
  Research Scientist
  tzu-ching.chang@jpl.nasa.gov/tzu@caltech.edu
  Jet Propulsion Laboratory
  California Institute of Technology
- **Olivier P. Doré**
  Research Scientist
  olivier.p.dore@jpl.nasa.gov/odore@caltech.edu
  Jet Propulsion Laboratory
  California Institute of Technology
- **Abigail T. Crites**
  Assistant Professor
  abigail.crites@astro.utoronto.ca
  University of Toronto