

I-Da Chiang

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RESEARCH INTERESTS

Molecular gas & Star formation

- Tracing molecular gas mass and kinematics is important to studying star formation. With high-sensitivity observations from modern instruments, our understanding in the CO-to-H₂ conversion factor has become the limiting factor of our ability on quantifying star formation efficiency. I measure kpc-scale CO-to-H₂ conversion factor in 37 galaxies, and propose a stellar-mass-based correction.

Dust Life Cycle & Interstellar Medium

- I am interested in studying the evolution of interstellar dust with multiwavelength observations. One of my main projects is measuring the spatially resolved dust-to-metals ratio in the nearby galaxies, and interpreting the results with dust chemical evolution models, simulations and ancillary data.

HI 21 cm Line & Radio Astronomy

- The distribution of neutral gas is a key element in dust sciences and full kinematics analysis in the extended disk. I reduce and image new HI 21cm line data observed with VLA in mainly two projects: (1) EveryTHINGS, a C+D survey of ~30 nearby galaxies; (2) PHANGS-JWST-HI, a B+C+D observation matching PHANGS-JWST targets.

RESEARCH POSITIONS

Institute of Astronomy and Astrophysics, Academia Sinica

- Postdoc Fellow

2021 - Present

Supervisor: Dr. Hiroyuki Hirashita

Projects: dust evolution, tracing molecular gas, and HI 21 cm observations

EDUCATION

University of California San Diego

- Ph.D. (Physics)

2014 - 2021

Thesis: "Observations of Spatially Resolved Dust Evolution in Nearby Galaxies"

Adviser: Prof. Karin M. Sandstrom

National Taiwan University

- M.S. (Physics)

2012 - 2014

Thesis: "Plasmonic Enhanced Optical Disk Reactor for Wastewater Treatment"

Adviser: Prof. Din Ping Tsai

- B.S. (Physics)

2007 - 2011

PUBLICATIONS (AS FIRST OR SECOND AUTHOR)

8) **I-Da Chiang** et al., "Resolved Measurements of the CO-to-H₂ Conversion Factor in 37 Nearby Galaxies", 2024, *ApJ*, 964, 18.

7) Yu-Hsuan Teng, **I-Da Chiang** et al., "Star Formation Efficiency in Nearby Galaxies Revealed with a New CO-to-H₂ Conversion Factor Prescription", 2024, *ApJ*, 961, 42.

- 6) **I-Da Chiang** et al., “Kpc-scale properties of dust temperature in terms of dust mass and star formation activity”, 2023, *MNRAS*, 520, 5506.
 - 5) Hiroyuki Hirashita & **I-Da Chiang**, “Analytic models of dust temperature in high-redshift galaxies”, 2022, *MNRAS*, 516, 1612.
 - 4) **I-Da Chiang** et al., “Resolving the Dust-to-Metals Ratio and CO-to-H₂ Conversion Factor in the Nearby Universe”, 2021, *ApJ*, 907, 29.
 - 3) Eric W. Koch, **I-Da Chiang** et al., “Spatial power spectra of dust across the Local Group: No constraint on disc scale height”, 2020, *MNRAS*, 492, 2663.
 - 2) Dyas Utomo, **I-Da Chiang** et al., “The Resolved Distributions of Dust Mass and Temperature in Local Group Galaxies”, 2019, *ApJ*, 874, 141.
 - 1) **I-Da Chiang** et al., “The Spatially Resolved Dust-to-metals Ratio in M101”, 2018, *ApJ*, 865, 117.
- A full list of my publications is available at [ORCID:0000-0003-2551-7148](https://orcid.org/0000-0003-2551-7148).

OBSERVING TIME AWARDED AS P.I.

VLA (2022B), “Connecting Gas and Dust: Mapping HI in 7 Herschel Galaxies”, 28 hours 2022

CERTIFICATIONS

Machine Learning Specialization 2023
 Coursera #2TT9G93HJ3LL (Offered by DeepLearning.AI & Stanford University)

Data Structures and Algorithms Specialization 2019
 Coursera #NKUTAK2CYZE6 (Offered by UC San Diego)

RESEARCH PRESENTATIONS

Contributed talk, “Resolved Maps of the CO-to-H₂ Conversion Factor in 41 Nearby Galaxies”, East Asian Young Astronomers Meeting, Chiang Mai, Thailand 2024

Contributed talk, “Tracing the kpc-scale CO-to-H₂ Conversion Factor with Dust in Galaxy Center”, Illuminating the Dusty Universe: A Tribute to the Work of Bruce Draine, Florence, Italy 2023

Contributed talk, “Kpc-scale properties of dust temperature in terms of dust mass and star formation activity”, The 13th meeting on Cosmic Dust, Kitakyushu, Japan 2023

Invited talk, “Quantifying the decrease of CO-to-H₂ conversion factor in galaxy centers”, Taiwanese Theoretical Astrophysics Workshop II, Taipei, Taiwan 2022

Lunch talk, “Quantifying the decrease of CO-to-H₂ conversion factor in galaxy centers”, ASIAA, Taipei, Taiwan 2022

Colloquium, “Multiwavelength observations of dust, gas, and metals in the $z \sim 0$ universe”, NCU, Taoyuan, Taiwan 2022

Contributed talk, “Dust, gas, and metals: Observing Dust Evolution in Nearby Galaxies”, Galaxy Evolution Workshop 2021, Tokyo, Japan 2021

Colloquium, “Observations of Spatially Resolved Dust Evolution in Nearby Galaxies”, ASIAA, Taipei, Taiwan 2021

Contributed talk, “Dust, gas and metals: Resolving the Dust Life Cycle in the Nearby Universe”, The AAS 235th Meeting, Honolulu, USA 2020

Seminar, “Dust-to-Metals Relation in Nearby Galaxies”, ASIAA, Taipei, Taiwan 2019

Contributed talk, “The Variation of the Dust-to-Metals Ratio in Resolved Nearby Galaxies”, Dusting the Universe, Tucson, USA	2019
Lunch talk, UCSD, San Diego, USA	2019
Lunch talk, UCSD, San Diego, USA	2018

SERVICES

Colloquium & Lunch talk committee @ ASIAA	2022 - Present
Journal club “Galread” organizer @ ASIAA	2022 - 2024
Postdoc representatives @ ASIAA	2021 - Present

OUTREACH

Cross-field seminar @ Institute of NanoEngineering and MicroSystems, NTHU – speaker	2024
Sharing experience abroad @ Taipei Astronomy Workshop – panelist	2024
Student seminar @ ASIAA – lecturer	2021
Research in physics workshop for community college students @ UCSD – lecturer	2021
Python workshop for physics undergrads @ UCSD – presenter	2019
Life as a scientist @ Jianguo High School – speaker	2019
STEM in Your Backyard: City Heights @ San Diego, USA – presenter	2018
Tech Trek @ UCSD – presenter	2017