

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 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.

EMPLOYMENT

Institute of Astronomy and Astrophysics, Academia Sinica Postdoc Fellow	<i>2021 - Current</i>
University of California San Diego Graduate Research Assistant Teaching Assistant (TA) and Lab TA Coordinator, PHYS 1-ABC Lab	<i>2014 - 2021</i>
National Taiwan University Graduate Research Assistant	<i>2012 - 2014</i>
Taiwan (R.O.C.) Armed Forces Company second-in-command (Second Lieutenant)	<i>2011 - 2012</i>

EDUCATION

University of California San Diego Ph.D. (Physics and Astronomy) Thesis: "Observations of Spatially Resolved Dust Evolution in Nearby Galaxies" Adviser: Prof. Karin M. Sandstrom	<i>2014 - 2021</i>
National Taiwan University M.S. (Physics) Thesis: "Plasmonic Enhanced Optical Disk Reactor for Wastewater Treatment" Adviser: Prof. Din Ping Tsai	<i>2012 - 2014</i>
National Taiwan University B.S. (Physics)	<i>2007 - 2011</i>

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”, accepted by ApJ, [arXiv:2311.00407](#).
- 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](#).

OBSERVING TIME AWARDED AS P.I.

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

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| (Planned) Colloquium, iNEMS, NTHU, Hsinchu, Taiwan | 2024 |
| Contributed talk, “Resolved Maps of the CO-to-H ₂ Conversion Factor in 41 Nearby Galaxies”, East Asian Young Astronomers Meeting, Chiang Mai, Thailand | 2024 |
| Contributed talk, “Tracing the kpc-scale CO-to-H ₂ 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-H ₂ conversion factor in galaxy centers”, Taiwanese Theoretical Astrophysics Workshop II, Taipei, Taiwan | 2022 |
| Lunch talk, “Quantifying the decrease of CO-to-H ₂ 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 -
"Galread" (journal club) organizer @ ASIAA	2021 -
Postdoc representatives @ ASIAA	2021 -

OUTREACH

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 – lecturer	2019
STEM in Your Backyard: City Heights @ San Diego, USA – presenter	2018
Tech Trek @ UCSD – presenter	2017