I-DA CHIANG

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RESEARCH INTERESTS

Dust life cycle and the interstellar medium
I am interested in the evolution of dust grains in the interstellar medium. One of my project is measuring the spatially resolved dust-to-metals ratio in the nearby galaxies, and interpreting the results with dust chemical evolution models, simulations and auxiliary data.

HI 21 cm line and radio data reduction
The distribution of neutral gas is a key element in dust-to-metals ratio studies. The HI 21 cm line traces neutral hydrogen atoms in the ISM. I reduced new HI 21cm line data of ∼30 galaxies observed by VLA with CASA. These new data allows us to construct a new dust-to-metals ratio survey in the nearby galaxies.

EXPERIENCE

University of California - San Diego, La Jolla, CA *Sep. 2014 - Est. Jun. 2021*
Graduate Research Assistant

- Built a python-based toolkit for dust SED fitting and multi-wavelength data analysis.
- Analyzed the dust-to-gas and dust-to-metal ratios in the spiral galaxy M101.
- Analyzed the dust-to-metal ratio and CO-to-H_2 conversion factor in detail in 5 nearby galaxies.
- Examined the empirical radiation distribution law and the turbulent power spectrum in the local group galaxies with the dust SED fitting tools.
- Reduced HI 21cm line data of ∼30 galaxies observed by VLA with the Common Astronomy Software Applications package (CASA).

University of California - San Diego, La Jolla, CA *Sep. 2014 - Jun. 2016*
Teaching Assistant (TA) and Lab TA Coordinator

- Familiarized new teaching assistants with lab setups and teaching skills.
- Led discussion sessions, which helped ∼ 40 students each week.
- Led introductory level physics lab, with 24 students per session.
- Improved course materials from feedback from teaching assistants and students.

National Taiwan University, Taipei City, Taiwan *Sep. 2012 - Jun. 2014*
Graduate Research Assistant

- Improved the photo-degradation reactor for wastewater treatment with plasmonic nano-particles.
- Built the protocol for maintaining/using the sputter machine and clean room.

Taiwan (R.O.C.) Armed Forces, Hsinchu County, Taiwan *Aug. 2011 - Jul. 2012*
Second Lieutenant (Company second-in-command)

EDUCATION

University of California - San Diego *Sep. 2014 - Est. Jun. 2021*
Ph.D. (Physics and Astronomy)
Adviser: Prof. Karin M. Sandstrom

National Taiwan University *Aug. 2012 - Jul. 2014*
M.S. (Physics)
Thesis: "Plasmonic Enhanced Optical Disk Reactor for Wastewater Treatment"
Adviser: Prof. Din Ping Tsai

National Taiwan University *Sep. 2007 - Jun. 2011*
B.S. (Physics)

REFEREED PUBLICATIONS AS FIRST OR SECOND AUTHOR

4) **I-D. Chiang**, K.M. Sandstrom, J. Chastenet, E. Koch, K. Kreckel, A.K. Leroy, A. Schruba, D. Utomo, T. Williams, "Resolving the Dust-to-Metals Ratio and CO-to-H_2 Conversion Factor in the Nearby Universe", 2020, arXiv:2011.10561, *accepted by ApJ.*

3) E.W. Koch, **I-D. Chiang**, D. Utomo, J. Chastenet, A.K. Leroy, E.W. Rosolowsky, K.M. Sandstrom, "Spatial power spectra of dust across the Local Group: No constraint on disc scale height", 2020, MNRAS, 492, 2663.

2) D. Utomo, **I-D. Chiang**, A.K. Leroy, K.M. Sandstrom, J. Chastenet, "The Resolved Distributions of Dust Mass and Temperature in Local Group Galaxies", 2019, ApJ, 874, 141.

1) **I-D. Chiang**, K.M. Sandstrom, J. Chastenet, L.C. Johnson, A.K. Leroy, D. Utomo, "The Spatially Resolved Dust-to-metals Ratio in M101", 2018, ApJ, 865, 117.

A full publication list at ADS Public Library is available here.

REFEREED PUBLICATIONS AS OTHER COAUTHOR

4) J. Chastenet, K. Sandstrom, **I-D. Chiang**, B.S. Hensley, B.T. Draine, K.D. Gordon, E.W. Koch, A.K. Leroy, D. Utomo, T.G. Williams, "Benchmarking Dust Emission Models in M101", 2020, *submitted to ApJ.*

3) J. Sun, A.K. Leroy, E.C. Ostriker, A. Hughes, E. Rosolowsky, A. Schruba, E. Schinnerer, G.A. Blanc, C. Faesi, J.M.D. Kruijssen, S. Meidt, D. Utomo, F. Bigiel, A.D. Bolatto, M. Chevance, **I-D. Chiang**, D. Dale, E. Emsellem, S.C.O. Glover, K. Grasha, J. Henshaw, C.N. Herrera, M.J. Jimenez-Donaire, J.C. Lee, J. Pety, M. Querejeta, T. Saito, K. Sandstrom, A. Usero, "Dynamical Equilibrium in the Molecular ISM in 28 Nearby Star-Forming Galaxies", 2020, ApJ, 892, 148.

2) A.K. Leroy, K.M. Sandstrom, D. Lang, A. Lewis, E.A. Behrens, J. Chastenet, **I-D. Chiang**, M.J. Gallagher, D. Utomo, "A $z = 0$ Multi-wavelength Galaxy Synthesis I: A WISE and GALEX Atlas of Local Galaxies", 2019, ApJS, 244, 24.

1) J. Chastenet, K.M. Sandstrom, **I-D. Chiang**, A.K. Leroy, D. Utomo, C. Bot, K.D. Gordon, B.T. Draine, Y. Fukui, T. Onishi, K. Tsuge, "Polycyclic Aromatic Hydrocarbon Fraction at $\sim$10 pc scale in the Magellanic Clouds", 2019, ApJ, 876, 62.

RESEARCH PRESENTATIONS

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

Special seminar, "Dust-to-Metals Relation in Nearby Galaxies", ASIAA, Taipei, Taiwan *2019*

Poster, ASROC2019, Taichung, Taiwan *2019*

Contributed talk, "The Variation of the Dust-to-Metals Ratio in Resolved Nearby Galaxies", Dusting the Universe, Tucson, USA *2019*

Lunch talk, University of California, San Diego, USA *2019*

Tea time talk, University of California, San Diego, USA *2018*

Poster, CPHDUST, Copenhagen, Denmark *2018*

Poster, ASROC2018, Kinmen, Taiwan *2018*

Lunch talk, University of California, San Diego, USA *2018*

TEACHING EXPERIENCE

Lab TA Coordinator, PHYS 1-ABC Lab – University of California, San Diego *2015 - 2016*

Teaching Assistant, PHYS 1-A Lab – University of California, San Diego *2014 - 2015*

OUTREACH EXPERIENCE

Python workshop for physics undergrads – presenter *2019*

STEM in Your Backyard: City Heights – presenter *2018*

Tech Trek: University of California, San Diego – presenter *2017*

Physics GRE bootcamp at UCSD – teaching assistant *2016*

AWARDS

Dean's Award, College of Science, National Taiwan University *2014*

Dean's Award, College of Science, National Taiwan University *2011*

Presidential Award, National Taiwan University *2011*