

Thomas (Shao-Yu) Lai

The University of Toledo

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Education

University of Toledo, USA	Ph.D. in Physics & Astronomy, 2014–present Advisor: Dr. J.D.T Smith
National Central University, Taiwan	B.A. in Space Science, 2011

Professional Experience

Keck Visiting Scholar, Keck Observatory, HI Mentor: Dr. Carlos Alvarez Project: <i>Updating DEIMOS Throughput Curves with 16 Years of Observations</i>	2018
UT University Fellow, University of Toledo, OH Advisor: Dr. J.D.T Smith Project: <i>Characterizing Properties of Small Dust Grains Across Different Galaxies</i>	2015–present
Doreen and Lyman Spitzer Graduate Fellow, University of Toledo, OH Advisor: Dr. Adolf Witt Project: <i>The Extended Red Emission in IC 59 and IC 63</i> <i>The Connection between DIBs and ERE</i>	2015–present
Research Assistant, ASIAA, Taiwan Advisor: Dr. Ciska Kemper , Dr. Masaaki Otsuka , and Dr. Sundar Srinivasan Project: <i>Near-infrared Photometry of Evolved Asymptotic Giant Branch Stars in M33</i>	2013–2014
Corporal, The Republic of China Army, Taiwan	2012
Research Assistant, National Central University, Taiwan Advisor: Dr. Chung-Ming Ko Project: <i>2MASS Whole Sky Star Count</i>	2011

Scientific Presentations

Talks:

- “Understanding small dust grains in different interstellar environments”
AAS dissertation talk, Hawaii, Jan 6, 2020
- “Outreach talk: DEIMOS Throughput After 16 Years of Operations”
Keck Visiting Scholar Party, Keck observatory, Dec 6, 2018
- “DEIMOS Throughput After 16 Years of Operations”
Keck Visiting Scholar Presentation, Keck observatory, Dec 5, 2018
- “Exploring Small Dust Grains Across Different Interstellar Environments”
Astronomy Seminar, Keck observatory, Nov 19, 2018
- “Extended Red Emission in IC 59 and IC 63”
Astronomy Seminar, JAXA, Japan, Jun 13, 2017
- “Extended Red Emission in IC63 & IC59: How Does it Produce?”
Astronomy Seminar, National Central University, Dec 31, 2015

- “The Mass Loss from Asymptotic Giant Branch Stars in M33”
The Astronomical Society of the Republic of China Annual Meeting, May 23–25, 2014
- “Near-Infrared Photometry of Evolved Stars in the Nearby Galaxy M33”
ASIAA Summer Student Presentation, Aug 29, 2013

Posters:

- “All the PAHs: a Spitzer–AKARI Cross-Archival Spectroscopic Survey of Aromatic Emission in Galaxies”
Dusting the Universe, The University of Arizona, Tucson, AZ, Mar 4–8, 2019
- “Near-Infrared Photometry of Evolved Stars in The Nearby Galaxy M33”
Science Eyes and Minds towards Cosmic Horizon, Sokendai, Japan, Nov 11–15, 2013
- “The Information of Milky Way from 2MASS Whole Sky Star Counts: the Bimodal Color Distributions”
IAU 28th General Assembly, Beijing, China, Aug 20–24, 2012

Article:

- IRSIG newsletter - “Revealing All the PAHs in Galaxies with an AKARI-Spitzer Survey”

Workshops:

- “Python in Astronomy 2018”, Flatiron Institute, NY, Apr 30– May 4, 2018
- “PAHs in the ISM: Observational, Experimental and Computational Tools”, Les Houches, France, Apr 2–6, 2018
- “ALMA/VLA/VLBA workshop”, University of Michigan, Mar 7, 2017
- “SciCoder 8”, Yale University, Aug 1–5, 2016

Honors and Awards

2019	Award for Best Graduate Student Presentation (\$125) <i>University of Toledo Astronomy Journal Seminar</i>
2019	FAMOUS travel grant (\$500) <i>American Astronomical Society</i>
2019	Graduate Research Scholar Travel Award (\$500) <i>College of Natural Science & Mathematics, University of Toledo</i>
2018	AAS Travel Grant (\$1,607) <i>American Astronomical Society</i>
2016	Award for Best Graduate Student Presentation (\$250) <i>University of Toledo Astronomy Journal Seminar</i>
2015–2019	University Fellowship (4 years - \$72,000 + tuition) <i>Highest award from Graduate School, University of Toledo</i>
2014	Doreen and Lyman Spitzer Graduate Fellowship in Astropysics (\$9,000) <i>Department of Physics and Astronomy, University of Toledo</i>
2008	Outstanding Award <i>National Central University</i>

Observation Proposal

- JWST GO1: *How Do the Small Survive: PAH's in Low Metallicity Starburst II Zw 40*, 2020 (PI: Lai, T)
- JWST GO1: *The Vanishing Act: PAHs and Heavy Element Abundance in M101*, 2020 (PI: Smith, J)

- **JWST GO1:** *The JWST Whirlpool Galaxy Treasury*, 2020 (PI: Sandstrom, K)
- **JWST GO1:** *CLASSYIR: The COS Legacy Archive Spectroscopic SurveY Infrared Treasury Project*, 2020 (PI: Berg, D)
- **JWST GO1:** *Searching for the Smallest Dust Grains in the Extremely Low Metallicity Dwarf Galaxy Leo P*, 2020 (PI: Tarantino, E)
- **JWST GO1:** *Kinematics of warm gas in AGN tori with NIRSspec high-resolution spectroscopy of CO absorption lines*, 2020 (PI: Baba, S)
- **JWST ERS 1288:** *Radiative Feedback from Massive Stars as Traced by Multiband Imaging and Spectroscopic Mosaics*, 2018 (PI: Berne, O)
- **Discovery Channel Telescope / DeVeny Spectrograph:** *The search of connection between Diffuse Interstellar Bands and Extend Red Emission*, 2017 (2017Q4T01), 1 full night (PI: Lai, T)
- **Keck/DEIMOS:** *Potential Connection Between DIBs and ERE in the Reflection/Emission Nebula IC 63*, 20170716, 1 full night (PI: Alvarez, C)
- **Discovery Channel Telescope / DeVeny Spectrograph:** *The search of connection between Diffuse Interstellar Bands and Extend Red Emission*, 2016 (2016Q3T02), 2 full nights (PI: Lai, T)
- **SMA (The Submillimeter Array):** *Using SMA to observe FU Orionis stars RNO 1C/1B*, 1 full night (PI: Lai, T)

Teaching Experience

- Graduate Teaching Assistant, Fall 2014, Summer 2016, Summer 2018, and Summer 2019
Including calculus based general physics labs and Astr1010 discussions

Skills

- Programming: Python, IDL, IRAF, SExtractor, HTML, \LaTeX , SQL
- Operating System: Mac OS, Linux, Windows

Publication

- [All the PAHs: an AKARI-Spitzer Cross-Archival Spectroscopic Survey of Aromatic Emission in Galaxies](#)
Lai, T.S.-Y., Smith, J.D.T, Baba, S, Spoon, H.W.W, Imanishi, ApJ, 905, 55
- [The Observational Constraints of the Extended Red Emission](#)
Witt, A.N, Lai, T.S.-Y., Astrophysics and Space Science Journal, 2020Ap&SS.365.58W
- [Are the Carriers of Diffuse Interstellar Bands and Extended Red Emission the Same?](#)
Lai, T.S.-Y., Witt, A.N, Alvarez, C, Cami, J, 2020MNRAS.492.5853L
- [Extended Red Emission in IC59 and IC63](#)

Lai, T.S.-Y., Witt, A.N, Crawford, K, 2017MNRAS.469.4933L

- [The Information of The Milky Way from Two Micron All Sky Survey Whole Sky Star Count: The Bimodal Color Distributions](#)
Chang, C.K., Lai, S.Y., Ko, C.M. & Peng, T.H., 2012, Astrophysical Journal, 759, 94

Service and Outreach

- Co-referee, *The Astrophysical Journal*, 2020-present
- Builder, AKARI-Spitzer Extragalactic Spectral Survey (ASESS), 2020-present
- Deputy Science Coordinator, the ALESS team, 2017-present
- Conference for Undergraduate Women in Physics (CUWiP), Jun 2018
- 50th anniversary of the Ritter Observatory, Oct 2017
- Cedar Point Physics, Science and Math Week, May 2016
- Total Lunar Eclipse Outreach Program, Sep 2015