Meng-Zhe Yang

Master of Science, National Tsing Hua University, Hsinchu city, Taiwan

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RESEARCH INTERESTS

My research interests center on the study of magnetic fields across core, molecular cloud, and structures around the galactic center using dust polarization observations. I focus on understanding the role of magnetic fields in the star formation process and investigating polarized dust emission characteristics as they relate to grain alignment mechanisms within these environments.

EDUCATION

National Tsing Hua University, Hsinchu City, Taiwan   September 2020 – July 2022
Master of Science in Astronomy   Cumulative GPA: 3.58/4.3
Thesis Title: "The JCMT BISTRO Survey: Unveiling the Magnetic Fields around Galactic Center"

National Tsing Hua University, Hsinchu City, Taiwan   September 2016 – July 2020
Bachelor of Science: Physics   Cumulative GPA: 2.47/4.3
Project: "Searching for New Young Stellar Objects with Improved Multi-dimensional Magnitude Space Method"

EXPERIENCE

National Tsing Hua University   Hsinchu City, Taiwan
Research Assistant   2023 – 2024
- Contributed to the BISTRO project, focusing on research in magnetic field structures in astrophysical environments.
- Managed data storage and maintenance of the public computer systems for the research group.
- Assisted with administrative tasks, including processing paperwork and ensuring project documentation was up-to-date.

National Synchrotron Radiation Research Center   Hsinchu City, Taiwan
Part-time Employee in Magnet Group   2020 – 2022
- Designed permanent and electromagnets with dipole and quadrupole configurations using the Mathematica package *Radia*.
- Simulated physical models in *Radia* to evaluate feasibility and performance of magnet designs.
- Completed administrative tasks and maintained project documentation.

PROJECTS

B-fields In STar-forming Region Observations (BISTRO)   2020 – 2024
- Processed data reduction for JCMT POL-2 $450\,\mu$m and $850\,\mu$m continuum polarization observations.
- Analyzed the magnetic field structures in: (1) the inner region of the Central Molecular Zone, including the $20\,\mathrm{km\,s^{-1}}$ molecular cloud, $50\,\mathrm{km\,s^{-1}}$ molecular cloud, and Circumnuclear Disk; (2) the massive star-forming region Onsala 2.
- Attended regular collaborative meetings to present research progress and discuss findings with team members.

Classification of Young Stellar Objects (YSOs) - Student Project   2017 – 2020
- Categorized evolved stars, regular stars, galaxies, and YSOs exclusively using photometry measurements from multiple bands (J, IR1, IR2, IR3, IR4, MP1).
- This YSO identification enhances the precision of star formation rate determinations, overcoming the limitation associated with incomplete YSO samples.

PUBLICATIONS

Journal paper
1. Meng-Zhe Yang et al 2025 *ApJ* 983 184, "The JCMT BISTRO Survey: Unveiling the Magnetic Fields around Galactic Center." DOI: 10.3847/1538-4357/adbe34

2. "The JCMT BISTRO Survey: Magnetic Fields Associated with a Network of Filaments in the Massive Star-forming Region Onsala 2" (In-Progress)

Co-author

1. Janik Karoly et al 2025 *ApJL* 982 L22, "The JCMT BISTRO Survey: Magnetic Fields Align with Orbital Structure in the Galactic Center." DOI: 10.3847/2041-8213/adbc67

2. Jintai Wu et al. 2024 *ApJL* 977 L31, "A Tale of Three: Magnetic Fields along the Orion Integral-shaped Filament as Revealed by the JCMT BISTRO Survey." DOI: 10.3847/2041-8213/ad93d2

3. Youngwoo Choi et al. 2024, *ApJ*, 977, 32, "The JCMT BISTRO Survey: The Magnetic Fields of the IC 348 Star-forming Region." DOI: 10.3847/1538-4357/ad88ed

4. Jia-Wei Wang et al. 2024, *ApJ*, 962, 136, "Filamentary Network and Magnetic Field Structures Revealed with BISTRO in the High-mass Star-forming Region NGC 2264: Global Properties and Local Magnetogravitational Configurations." DOI: 10.3847/1538-4357/ad165b

5. Janik Karoly et al. 2023, *ApJ*, 952, 29, "The JCMT BISTRO Survey: Studying the Complex Magnetic Field of L43." DOI: 10.3847/1538-4357/acd6f2

6. Derek Ward-Thompson et al. 2023, *ApJ*, 946, 62, "First BISTRO Observations of the Dark Cloud Taurus L1495A-B10: The Role of the Magnetic Field in the Earliest Stages of Low-mass Star Formation." DOI: 10.3847/1538-4357/acbea4

7. Tao-Chung Ching et al. 2022, *ApJ*, 941, 122, "The JCMT BISTRO-2 Survey: Magnetic Fields of the Massive DR21 Filament." DOI: 10.3847/1538-4357/ac9dfb

8. Jihye Hwang et al. 2022, *ApJ*, 941, 51, "The JCMT BISTRO Survey: A Spiral Magnetic Field in a Hub-filament Structure, Monoceros R2." DOI: 10.3847/1538-4357/ac99e0

WORKSHOPS & CONFERENCES

2025 ASROC Annual Meeting - Oral Presentation May 2024
- National Formosa University, Yunlin County, Taiwan

Annual Meeting of the Physical Society of Taiwan - Oral Presentation January 2025
- National Sun Yat-sen University, Kaohsiung, Taiwan

NCTS Student Lunch Seminar - Oral Presentation November 2024
- National Taiwan University, Taipei City, Taiwan

2024 ASROC Annual Meeting - Poster May 2024
- National Changhua University of Education, Changhua County, Taiwan

Magnetic Fields from Clouds to Stars - Poster March 2024
- Mitaka Campus, National Astronomical Observatory of Japan, Tokyo, Japan

Protostars & Planets VII - Poster April 2023
- Kyoto International Conference Center, Kyoto, Japan

East-Asian ALMA Science Workshop 2023 February 2023
- The Great Roots Resort, New Taipei City, Taiwan

2023 ASROC Annual Meeting - Oral Presentation May 2023
- National Sun Yat-sen University, Kaohsiung, Taiwan

NCTS-ASIAA Workshop: Stars, Planets, and Formosa - Poster August 2022
- National Taiwan University, Taipei City, Taiwan

2020 ASROC Annual Meeting - Poster May 2020
- ASIAA Auditorium, Taipei City, Taiwan

SKILLS

- **Programming:** Python (Advanced), C++ (Intermediate), Mathematica, Fortran, LaTeX, Unix shell scripting
- **Software:** Starlink, Astropy, CASA, CARTA, IRAF, Astrodendro
- **Soft Skills:** Collaboration, Scientific Communication, Problem-Solving