

Ming-Tang Chen for Distinguished Research Fellow

Ming-Tang Chen

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Research Fellow, Institute of Astronomy and Astrophysics, Academia Sinica (2004–present)

Site Director, ASIAA Hawaii Operations (2003–present)

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RESEARCH FOCUS

High-frequency VLBI, submillimeter instrumentation, polar-site telescopes, digital backends, and frontier experiments in black-hole imaging and strong-gravity astrophysics.

My work centers on building and leading the systems that enable world-first VLBI observations at extreme frequencies (230–690 GHz), linking engineering, atmospheric calibration, and fundamental science.

MAJOR SCIENTIFIC ACHIEVEMENTS

Principal Architect of the Greenland Telescope (GLT)

- Led the GLT from concept to engineering, deployment, and operations on the Greenland ice sheet.
- Directed all ASIAA VLBI technical integration, cryogenics, and system commissioning.
- Enabled GLT participation in EHT campaigns from 2018 onward, contributing to the M87* and Sgr A* black hole images.
- First author of the PASP 2023 GLT construction and commissioning paper.

World's First VLBI Fringe Detection at 690 GHz (2024) (ALMA-APEX baseline)

- Initiated, designed, and led the first attempt at near-terahertz VLBI (ALMA-APEX-JCMT-GLT).
- Coordinated Band-9 phasing at ALMA, installed a new 690 GHz receiver at JCMT, and secured optical atomic clocks to replace the SMA maser.
- Achieved the highest-frequency VLBI detection ever recorded, validating sensitivity, coherence, and phasing at 690 GHz.
- Established the technical pathway toward photon-ring observations and routine near-terahertz VLBI.

Long-term leadership of Hawaii Operations (JCMT, GLT, FRB arrays)

- Over two decades, built ASIAA's Hawaii operations into a major mm/submm instrumentation and VLBI hub.
- Co-led JCMT upgrades, including VLBI backend integration, high-frequency receivers, and operations.
- Founded and led multiple ASIAA efforts: SMA receiver/antenna/system, AMiBA, ALMA Front-End Integration Center in Taiwan, JCMT 690 GHz VLBI, and all-sky FRB arrays in Hawaii.

CURRENT POSITIONS & LEADERSHIP ROLES

- **Chair, Board of Directors, East Asian Observatory** (2025.3–present)
- Site Director, ASIAA Hawaii Operations (2003.10–present)
- Research Fellow, ASIAA (2004.05–present)

EDUCATION

- Ph.D., Physics, University of Illinois at Urbana–Champaign (1993.10)
- B.S., Physics, National Cheng Kung University (1986.5)

SELECTED AWARDS

- **Breakthrough Prize in Fundamental Physics** (EHT Collaboration, 2020)
- NSF Diamond Achievement Award (2019)
- Golden Tripod Award for The Black Hole Catchers (2021)
- Albert Einstein Medal (EHT Collaboration, 2020)
- RAS Group Achievement Award (EHT Collaboration, 2021)

SELECTED COMMITTEE & COMMUNITY SERVICE

- **Peer Review Committee Member**, NRC Herzberg Astronomy and Astrophysics Research Centre Evaluation (2026)
- Section Chair, AS107: Radio Telescope, Technologies, and Methods, SPIE Astronomical Telescope + Instrumentation (2026)
- Reviewer, Higher Education Sprout Project, Ministry of Education (Taiwan) (2023–present)
- Reviewer, ALMA 2030 WSU SRR (2022)
- Chair, ASTE Band 7+8 Receiver Development Project Review (2021)

SELECTED PUBLICATIONS (past ten years)

Total publication record (February 2026): 152 papers (85 journal articles, 62 conference proceedings, 3 preprints, 1 thesis, 1 scholarly book), including 68 senior-author (PI/supervisory) publications and 71 instrument-development works spanning astronomy, microwave engineering, digital signal processing, and cryogenic systems. In addition, an award-winning science book communicates the scientific and instrumental foundations of the Event Horizon Telescope to a broad audience., translating submillimeter VLBI and horizon-scale physics into public scientific discourse.

(† = high-impact / directly relevant to DRF case)

1. †Chen, M.-T. et al., 2026, First VLBI fringe detection at 690 GHz, submitted to **PASP**
2. †Chen, M.-T., Asada, K., Matsushita, S., et al., 2023, The Greenland Telescope – Construction, commissioning, and operations in Pituffik, **PASP**, 135, 095001
3. EHT Collaboration, 2025, Horizon-scale variability of M87* from 2017–2021 EHT observations, **A&A**, 704, A91
4. EHT Collaboration, 2025, The persistent shadow of the supermassive black hole of M87, **A&A**, 693, A265
5. Raymond, A. W., Doeleman, S. S., Asada, K., et al., 2024, First very long baseline interferometry detection at 870 μm , **AJ**, 168, 130

6. Liu, R., Asada, K., Krichbaum, T., et al., 2023, A ring-like accretion structure in M87, **Nature**, 616, 686
7. EHT Collaboration, 2022, First Sgr A* results. I. The Shadow of the SMBH*, **ApJL**, 930, L12 (six papers)
8. EHT Collaboration, 2021, First M87 results. VII. Polarization, **ApJL**, 910, L12 (two papers)
9. EHT Collaboration, 2019, First M87 results. I. The shadow, **ApJL**, 875, L1 (six papers)
10. Matsushita, S., Asada, K., Martin-Cocher, P., et al., 2017, 3.5-yr monitoring of 225 GHz opacity at Greenland summit, **PASP**, 129, 025001
11. Lin, K.-Y., Nishioka, N., Wang, F.-C., et al., 2016, AMiBA: Cluster Sunyaev-Zel'dovich effect observation with the expanded 13-element array, **ApJ**, 830, 91
12. Jiang, H., Yu, C.-Y., Kubo, D., et al., 2016, A low-cost 4-bit 10 Giga-sample-per-second ADC PCB assembly for FPGA-based backend, **PASP**, 128, 115002

BOOKS & OUTREACH

Chen, Ming-Tang, *Black Hole Capturers (黑洞捕手)*, Commonwealth Publishing Co., Ltd., Taipei, Taiwan, April 2020.

45th Golden Tripod Award (金鼎獎) recipient (2021).

Numerous invited public lectures, media interviews, and documentaries on black holes & VLBI.