

TAWEEWAT SOMBOONPANYAKUL

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EMPLOYMENT

Chulalongkorn University Lecturer in the Physics Department	<i>Nov 2023 - present</i>
Stanford University Kavli Fellow - Institutional fellowship at KIPAC	<i>Aug 2021 - Oct 2023</i>

EDUCATION

Massachusetts Institute of Technology Ph.D. in Physics, Advisor: Prof. Michael McDonald Thesis: The Clusters Hiding in Plain Sight (CHiPS) survey	<i>Aug 2015 - Aug 2021</i>
University of Chicago BA in Physics with specialization in Astrophysics Honor Thesis Advisor: Prof. Hsiao-Wen Chen	<i>Sept 2011 - Jun 2015</i>

AWARDS

2025 **COSPAR Capacity Building Fellowship Program**, International Astronomical Union (IAU)
2024 **Grants for Development of New Faculty Staff** (120,000 Baht), Chulalongkorn University
2021 **The Kavli Fellowship**, Postdoctoral Research Fellowship, Stanford University
2019 Representative to Lindau Nobel Laureate Meetings, Lindau, Germany
2015 **MIT Clark Fellow**, Graduate Research Fellowship, MIT
2015 **Phi Beta Kappa, Dean's List**, The University of Chicago
2014 **The FOTI Global Leadership Award**, The University of Tokyo
2014, 2015 **The Maroon Key Society**, The University of Chicago
2013 **Walter and Fay Selove Prize in Physics**, The University of Chicago

SELECTED PRESS

- Daily Galaxy – “690 Trillion Suns-new look at an ancient quasar so bright it obscured a massive galaxy cluster”, Oct. 2021
- MIT News Press – “MIT astronomers discover galaxy clusters hiding in plain sight”, Mar. 2021
- NASA Press – “A weakened black hole allows its galaxy to awaken”, Nov. 2019
- MIT News Press – “Sprawling galaxy cluster found hiding in plain sight”, Aug. 2018
- Space.com Press – “Huge Galaxy Cluster Found Hiding in Plain Sight”, Jun. 2018

OBSERVING

Successful Telescope Proposal as PI or as the majority contributor

- Thai National Telescope (TNO), 2024, 3 nights, “LRS Spectroscopy of potential spiral bright cluster galaxies (BCGs) at $z \sim 0.4$ ”
- Thai National Radio Telescope (TNRT), 2024, 9hr, “CHIPS1911+4455: Detecting radio emission in the cooling flow of a massive, merging cluster”
- Chandra Cycle 25, 2023, 57ks, “Deep X-ray Observations of a highly luminous cool-core galaxy cluster at $z \sim 0.4$ ”
- Chandra Cycle 24, 2022, 89ks, “Deep X-ray Observations of a new, highly luminous cool-core galaxy cluster at $z \sim 0.6$ ”
- Chandra Cycle 23, 2021, 133ks, “CHIPS1911+4455: A Cooling Flow in a Merging Cluster”
- Hubble, 2019 Mid Cycle, 2 orbits, “Imaging a Rare Starburst Central Galaxy in a Merging Cluster”
- Magellan, 2018B, 3 nights, “Spectroscopic Follow Up for the CHiPS galaxy clusters candidates”

- Chandra, 2018, 137ks, “A Unique Sample of Extreme-BCG Clusters at $0.2 < z < 0.6$ ”
- Magellan, 2017B, 3 nights, “The CHiPS Surveys: Clusters Hiding in Plain Sight”
- Magellan, 2016A, 3 nights, “The CHiPS Surveys: Clusters Hiding in Plain Sight”

Observing Experience

- Magellan Telescope, Las Campanas Observatory (LCO), Long-slit spectroscopy with LDSS3, 2018
- Magellan Telescope, (LCO), Optical imaging with PISCO, 2017B
- Magellan Telescope, (LCO), Optical imaging with PISCO, 2017A
- Magellan Telescope, (LCO), Optical imaging with PISCO, 2016B

TEACHING AND MENTORING

Mentoring

- Tutoring low income high school students at Peninsula Bridge programs, Palo Alto, Fall 2022
- Supervising undergraduate students for summer research projects, Stanford, 2022
- Mentoring 6 undergraduate students in Physics at MIT for academic and social supports, MIT, 2020 (Austin Chin, Sydney Kim, Michael Kraus, Armando Martinez, Sarah Zhao, Amanda Zheng)

Undergraduate/Graduate Taught Courses

- Graduate Teaching Assistant in 8.01 Physics I - Mechanics at MIT, Fall 2020
- Graduate Teaching Assistant, for Prof. Michael McDonald in 8.902 graduate-level Astrophysics II at MIT, Fall 2019
- Graduate Teaching Assistant, for Prof. Kiyoshi Masui in 8.01 Physics I - Mechanics at MIT, Fall 2018
- College Core Tutor Program for Physics at the University of Chicago, 2015

SERVICE

- Session Chair, “Astronomy”, 20th Siam Physics Congress, Khon Kaen, TH, 2025
- Chandra Peer Review Panel, NASA, Cycle 24/27, 2022/2025
- Astrophysics Graduate Admission Committee, Stanford University, 2022/2023
- Session Chair, “Galaxy Cluster I”, 235th Meeting American Astronomical Society, 2020

OUTREACH

- Organizing Committee at KIPAC Community Day, Stanford, CA, Apr. 2023
- Volunteer at College of San Mateo, “Family Science Day”, San Mateo, CA, Sep. 2022
- Invited Speaker in the **Benjamin Dean Astronomy Lecture** series, “Decoding the Mystery of Dark Matter Using Galaxy Clusters”, California Academy of Sciences, San Francisco, CA, Aug. 2022
- Guest Speaker at Sacred Heart Prep School, Atherton, CA, May. 2022
- Guest Speaker at BASIS Independent Silicon Valley School, San Jose, CA, Mar. 2022 (virtual)
- Member of MIT Astrogazers, Observing with the public on the sidewalk, 2017-2021
- Volunteer at Vatino STEM Alliance Science Festival, Apr. 2019
- Volunteer at Cambridge Science Festival, “Solar Observing”, Apr. 2018
- Volunteer at MIT Museum, “Nautical Day with Celestial Navigation”, Mar./Nov. 2018
- Volunteer at MIT Museum, “Mathernoon Day”, Mar./Nov. 2018
- Public Speaker at Mahidol University, “Impact of Active Galaxies on Clusters”, Aug. 2017
- World Wide Telescope Ambassadors at Harvard University, 2016
- Organizer for a Yerkes Observatory Weekend Workshop, WI, 2014
- President of Ryerson Astronomical Society at the University of Chicago, 2013-2014

RESEARCH PRESENTATION

Invited Talks (Conference)

- 20th Siam Physics Congress 2025, Khon Kaen, TH, Jun. 2025 “SPT-CL J0417-4748: A Case of a Relaxed Galaxy Cluster Lacking Central Star Formation”
- 19th Siam Physics Congress 2024, Ayutthaya, TH, Jun. 2024 “CHIPS1911+4455: A Cooling flow in a Merging Cluster”

Contributed Talks (Conferences)

- McNamara@65, Waterloo, Canada, May 2024 “CHIPS1911+4455: A Cooling Flow in a Merging Cluster”
- East Asian Young Astronomers Meeting (EAYAM) 2024, Chiang Mai, TH, Jan. 2024 “Why and How Do We Study Relaxed Galaxy Clusters?”
- High-Resolution X-ray Spectroscopy: A Chandra Workshop, Cambridge, MA, Aug. 2023 “Advancing X-ray Background Modeling for Enhanced Data Analysis”
- 237th Meeting American Astronomical Society, AAS, Jan. 2021, “Galaxy Clusters and AGN Feedback” (virtual)
- 235th Meeting American Astronomical Society, AAS, Honolulu, HI, Jan. 2020, “Clusters Hiding in Plain Sight (CHiPS)”
- Planetary Systems: A Synergistic View, ICISE, Quy Nhon, Vietnam, Jul. 2015, “Transiting Exoplanet’s Impact Parameter: Long vs Short Cadence”
- UChicago-Northwestern Exoplanet Workshop, Alder Planetarium, IL, 2014, “Transiting Exoplanet’s Impact Parameter: Long vs Short Cadence”

Seminars

- Stanford University, Stanford, CA, Aug. 2023
- National Astronomical Research Institute of Thailand, Chiang Mai, Thailand, Feb. 2023
- University of Southampton, Southampton, UK, Mar. 2022 (virtual)
- University of North Texas, Denton, TX, Feb. 2022 (virtual)
- University of California, Santa Cruz, Santa Cruz, CA, Feb. 2021 (virtual)
- The Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA, Feb. 2021 (virtual)
- California Institute of Technology, Pasadena, CA, Feb. 2021 (virtual)
- Stanford University, Stanford, CA, Dec. 2020 (virtual)
- Space Telescope Science Institute, Baltimore, MD, Nov. 2020 (virtual)
- University of Michigan, Ann Arbor, MI, Oct. 2020 (virtual)
- The University of Missouri–Kansas City, Kansas City, MO, Aug. 2020 (virtual)
- National Astronomical Research Institute of Thailand, Chiang Mai, Thailand, Jan. 2019
- Chiang Mai University, Chiang Mai, Thailand, Jan. 2019
- Kasetsart University, Bangkok, Thailand, Jan. 2019
- Mahidol University, Bangkok, Thailand, Jan. 2019
- Carnegie Observatories, Pasadena, Dec. 2018

Conference Posters

- 20th Meeting High Energy Astrophysics Division (HEAD), Waikoloa Village, HI, Mar. 2023
- 19th Meeting High Energy Astrophysics Division (HEAD), Pittsburgh, PA, Mar. 2022
- Tracing Cosmic Evolution with Clusters of Galaxies, Sesto (BZ), Italy, Jul. 2019
- 69th Lindau Nobel Laureate Meeting, Lindau, Germany, Jul. 2019
- 17th Meeting High Energy Astrophysics Division (HEAD), Monterey, CA, Mar. 2019
- SnowCluster – The Physics of Galaxy Clusters, Snowbird, UT, Mar. 2018
- Chandra Science for the Next Decade, Cambridge, MA, Aug. 2016
- 227th Meeting American Astronomical Society, AAS, Kissimmee, FL, Jan. 2016

REFEREED PUBLICATIONS

1. Romero, C. E., M. Gaspari, G. Schellenberger, et al. ..., **Somboonpanyakul, T.** (2025), SZ–X-Ray Surface Brightness Fluctuations in the SPT-XMM Clusters, *ApJ*, 985, 248

2. Sarkar, A., M. McDonald, L. Bleem, et al. ..., **Somboonpanyakul, T.** (2025), Constraints on Nonthermal Pressure at Galaxy Cluster Outskirts from a Joint SPT and XMM-Newton Analysis, *ApJL*, 984, L63
3. Muhibullah, M., M. Brodwin, M. McDonald, et al. ..., **Somboonpanyakul, T.** (2025), The Massive and Distant Clusters of WISE Survey. XII. Exploring X-Ray Active Galactic Nuclei in Dynamically Active Massive Galaxy Clusters at $z=1$, *ApJ*, 983, 47
4. Bocquet, S., S. Grandis, E. Krause, et al. ..., **Somboonpanyakul, T.** (2025), Multiprobe cosmology from the abundance of SPT clusters and DES galaxy clustering and weak lensing, *PhRvD*, 111, 063533
5. Reefe, M., M. McDonald, M. Chatzikos, et al. ..., **Somboonpanyakul, T.** (2025), Directly imaging the cooling flow in the Phoenix cluster, *Natur*, 638, 360
6. Migkas, K., M. W. Sommer, T. Schrabback, et al. ..., **Somboonpanyakul, T.** (2025), X-ray and optical analysis of the distant merging double cluster SPT-CLJ2228-5828, its gas bridge, and its shock front, *A&A*, 694, A45
7. Calzadilla, M. S., M. McDonald, B. A. Benson, et al. ..., **Somboonpanyakul, T.** (2024), The SPT-Chandra BCG Spectroscopic Survey. I. Evolution of the Entropy Threshold for ICM Cooling and AGN Feedback in Galaxy Clusters over the Last 10 Gyr, *ApJ*, 976, 169
8. Bocquet, S., S. Grandis, L. E. Bleem, et al. ..., **Somboonpanyakul, T.** (2024), SPT clusters with DES and HST weak lensing. II. Cosmological constraints from the abundance of massive halos, *PhRvD*, 110, 083510
9. Bocquet, S., S. Grandis, L. E. Bleem, et al. ..., **Somboonpanyakul, T.** (2024), SPT clusters with DES and HST weak lensing. I. Cluster lensing and Bayesian population modeling of multi-wavelength cluster datasets, *PhRvD*, 110, 083509
10. Klein, M., J. J. Mohr, S. Bocquet, et al. ..., **Somboonpanyakul, T.** (2024), SPT-SZ MCMF: an extension of the SPT-SZ catalogue over the DES region, *MNRAS*, 531, 3973
11. Romero, C. E., M. Gaspari, G. Schellenberger, ..., **Somboonpanyakul, T.** et al. (2024), Surface Brightness Fluctuations in Two SPT Clusters: A Pilot Study, *ApJ*, 970, 73
12. Casas, M. C., K. Putnam, A. B. Mantz, ..., **Somboonpanyakul, T.** et al. (2024), Optical Photometric Indicators of Galaxy Cluster Relaxation, *ApJ*, 967, 14
13. Bleem, L. E., M. Klein, T. M. C. Abbot, ..., **Somboonpanyakul, T.** et al. (2024), Galaxy Clusters Discovered via the Thermal Sunyaev-Zel'dovich Effect in the 500-square-degree SPTpol Survey, *OJAp*, 7, 13
14. Kim, K. J., M. B. Bayliss, A. G. Noble, ..., **Somboonpanyakul, T.** et al. (2023), A Gradual Decline of Star Formation since Cluster Infall: New Kinematic Insights into Environmental Quenching at $0.3 < z < 1.1$, *ApJ*, 955, 32
15. Ruppin, F., M. McDonald, J. Hlavacek-Larrondo, ..., **Somboonpanyakul, T.** et al. (2023), Redshift Evolution of the Feedback-Cooling Equilibrium in the Core of 48 SPT Galaxy Clusters: A Joint Chandra-SPT-ATCA Analysis, *ApJ*, 948, 49
16. Calzadilla, M. S., L. E. Bleem, M. McDonald, ..., **Somboonpanyakul, T.** et al. (2023), SPT-CL J2215-3537: A Massive Starburst at the Center of the Most Distant Relaxed Galaxy Cluster, *ApJ*, 947, 44
17. Masterson, M., M. McDonald, B. Ansarinejad, ..., **Somboonpanyakul, T.** et al. (2023), Evidence for AGN-regulated Cooling in Clusters at $z \sim 1.4$: A Multiwavelength View of SPT-CL J0607-4448, *ApJ*, 944, 164
18. Strazzullo, V., Pannella, M., Mohr, J. J., ..., **Somboonpanyakul, T.**, et al. (2023), Galaxy populations in the most distant SPT-SZ clusters. II. Galaxy structural properties in massive clusters at $1.4 \leq z \leq 1.7$, *A&A*, 669, A131
19. Hernández-Lang, D., A. Zenteno, A. Diaz-Ocampo, ..., **Somboonpanyakul, T.** et al. (2022), Clash of Titans: A MUSE dynamical study of the extreme cluster merger SPT-CL J0307-6225, *MNRAS*, 517, 4355
20. Olivares, V., Y. Su, P. Nulsen, ..., **Somboonpanyakul, T.** et al. (2022), AGN feedback duty cycle in Planck SZ selected clusters using Chandra observations, *MNRAS*, 516, L101

21. Khullar, G., M. B. Bayliss, M. D. Gladders, ..., **Somboonpanyakul, T.** et al. (2022), Synthesizing Stellar Populations in South Pole Telescope Galaxy Clusters. I. Ages of Quiescent Member Galaxies at $0.3 < z < 1.4$, *ApJ*, 934, 177
22. **Somboonpanyakul, T.**, M. McDonald, A. Noble, et al. (2022), The Evolution of AGN Activity in Brightest Cluster Galaxies, *AJ*, 163, 146
23. **Somboonpanyakul, T.**, M. McDonald, M. Gaspari, et al. (2021), The Clusters Hiding in Plain Sight (CHiPS) Survey: Complete Sample of Extreme BCG Clusters, *ApJ*, 910, 60
24. **Somboonpanyakul, T.**, M. McDonald, M. Bayliss, et al. (2021), The Clusters Hiding in Plain Sight (CHiPS) Survey: CHIPS1911+4455, a Rapidly Cooling Core in a Merging Cluster, *ApJL*, 907, L12
25. McDonald, M., B. R. McNamara, G. M. Voit, ..., **Somboonpanyakul, T.** et al. (2019), Anatomy of a Cooling Flow: The Feedback Response to Pure Cooling in the Core of the Phoenix Cluster, *ApJ*, 885, 63
26. **Somboonpanyakul, T.**, M. McDonald, H. W. Lin, et al. (2018), The Clusters Hiding in Plain Sight (CHiPS) Survey: A First Discovery of a Massive Nearby Cluster around PKS 1353-341, *ApJ*, 863, 122