Yifan Sun

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Research Interests

Multi-wavelength studies of pulsars, pulsar wind nebulae and supernova remnants; modelling of high energy processes

Education

The University of Hong Kong — Hong Kong, China
Doctor of Philosophy in Physics, advised by Prof. Stephen Chi-Yung Ng — *Sep. 2023 – Aug. 2027 (Expected)*

McGill University — Montreal, Canada
Bachelor of Science in Honours Physics, CGPA 3.99/4.00 — *Sep. 2019 – June 2023*

Publications

[1] Joseph D. Gelfand, Chi-Yun Ng, Bettina Posselt, Mallory S. E. Roberts, Subir Bhattacharyya, Shi Dai, Rene Breton, Benjamin Stappers, Andrea Possenti, Jason Hessels, **Yifan Sun**, and Moaz Abdelmaguid. "Understanding Pulsar Wind Nebulae with the SKA". In: *Advancing Astrophysics with the SKA I*. **2026**, 170, p. 170.

[2] **Yifan Sun**, C.-Y. Ng, and Siming Liu. "Magnetic Flux Tubes Illuminated by Pulsar Winds". In: *The Astrophysical Journal* 999.2, 230 (**Mar. 2026**), p. 230.

[3] Joseph D. Gelfand, C.-Y. Ng, B. Posselt, Mallory S. E. Roberts, Subir Bhattacharyya, Shi Dai, Rene Breton, Benjamin Stappers, Andrea Possenti, Jason Hessels, **Yifan Sun**, and Moaz Abdelmaguid. "Understanding Pulsar Wind Nebulae with the SKA". In: *The Open Journal of Astrophysics* 8 (**Dec. 2025**), p. 54247.

[4] Kristen C. Dage, **Yifan Sun**, Arunav Kundu, Stephen E. Zepf, and Daryl Haggard. "Far ultra-violet insights into NGC 1399's globular cluster population". In: *Monthly Notices of the Royal Astronomical Society* 518.1 (**Jan. 2023**), pp. 87–92.

[5] Erica Thygesen, **Yifan Sun**, Jeff Huang, Kristen C. Dage, Stephen E. Zepf, Arunav Kundu, Daryl Haggard, and Thomas J. Maccarone. "Globular cluster ultraluminous X-ray sources in the furthest early-type galaxies". In: *Monthly Notices of the Royal Astronomical Society* 518.3 (**Jan. 2023**), pp. 3386–3396.

[6] Jeff Huang, **Yifan Sun**, Kristen Dage, and Daryl Haggard. "Probing M87 Globular Clusters for Flaring Ultraluminous X-Ray Sources". In: *Research Notes of the American Astronomical Society* 5.6, 136 (**June 2021**), p. 136.

Awarded Telescope Proposals

XMM-Newton
- *Understanding the offset between pulsar wind nebula X-ray and TeV emission* (PI, AO-25, 44 ks)

Einstein Probe Follow-up X-ray Telescope
- *Understanding the offset between pulsar wind nebula X-ray and TeV emission* (PI, Cycle 2, 33 ks)

The Karl G. Jansky Very Large Array
- *Deep Radio Searches for PWN PeVatrons* (Co-PI, 2026A, 2.2 hr)

Honours and Awards

HKU Presidential PhD Scholar Programme, The University of Hong Kong — 2023
Horace Watson Medal and Prize, McGill University — 2023
Dean's Honour List, McGill University — 2023, 2021, 2020
Wing Hing Chan Scholarship in Science, McGill University — 2021
Faculty of Science Scholarship, McGill University — 2020

Teaching Experience

Teaching Assistant/Lab Demonstrator — Sep. 2023 – Present
PHYS4656/8656 Advanced Astrophysics, PHYS1650, 1st/2nd Year Lab — *The University of Hong Kong*

Talks

COSPAR 2026, Istituto Nazionale di Astrofisica — Aug. 2026
The 2nd LHAASO Symposium, The Chinese University of Hong Kong — Mar. 2025
International Pulsar Symposium 2024, National Astronomical Observatories, CAS — Dec. 2024

Language and Skills

Astrophysical data analysis
- X-ray imaging and spectroscopy: Chandra, XMM-Newton, NuSTAR, EP-FXT, Suzaku (using CIAO, HEASoft, XMM-Newton SAS, XMM-ESAS, FXT DAS)
- Radio continuum imaging and polarimetry: MeerKAT, ASKAP, VLA, ATCA (using CASA, Miriad, Obit, AIPS)

Programming and computing
- Python (including Astropy, naima, NumPy, Matplotlib, statsmodels, SciPy, Pandas), Mathematica, LaTeX
- Tools: GNU/Linux, Bash, Git, Docker, PostgreSQL, Azure
- Experience in Linux administration and management (Sysadmin)

Language
- Mandarin Chinese (native), English (proficient), Japanese (intermediate, JLPT N2)