Fengqiu Adam Dong

FengqiuAdamDong | ORCID 0000-0003-4098-5222 | adamdong@phas.ubc.ca | +1 236 869 8628

Summary

I am a PhD candidate at the University of British Columbia Physics and Astronomy Department and an ALMA Ambassador. My main research interest is in pulsars and fast radio bursts. I am interested in understanding their characteristics and, in doing so, using them to push the frontiers of astronomy.

Education

PhD candidate in Astronomy at The University of British Columbia — 2020 - present
Thesis advisor: Ingrid Stairs

Masters of Science in Astronomy at The University of British Columbia — 2018-2021
Thesis advisor: Ingrid Stairs

Bachelor of Science in Physics (Honours) at The University of Auckland NZ — 2016-2017
Thesis advisor: J.J Eldridge

Bachelor of Engineering (Honours) at The University of Auckland NZ — 2010-2015

Related Employment

Outer Space Institute Research Assistant	2023-present
Graduate Student (University of British Columbia)	2018-present
Research Scholar (University of Auckland)	2017-2017
Research Scholar (University of Sydney)	2016-2017
Research Scholar (Australian National University)	2015-2016
Mechatronics Test Engineer (BEP Marine)	2013-2015

Teaching and advising

I served as head teaching assistant for Astronomy 101 at the University of British Columbia
I co-mentored undergraduate student Timothy Yu, who found three new pulsars in the CHIME database

Talks - invited

Fengqiu Adam Dong - With great telescope power comes great pulsar hunting responsibilities, an overview of the CHIME/FRB/Pulsar galactic transient discoveries - Invited talk at the Herzberg Institute National Research Council of Canada (2023)
Fengqiu Adam Dong - An assortment of galactic science results using CHIME/FRB - Invited talk at West Virginia University (2023)

Fengqiu Adam Dong - Overview of CHIME/FRB and CHIME/Pulsar instruments and science. Invited talk at Victoria University of Wellington (2022)
Fengqiu Adam Dong, Bradley Meyers, Ingrid Stairs - The first CHIME/FRB catalog. Invited talk at the UBC Astronomy Colloquium (2021)
Fengqiu Adam Dong - Finding new pulsars using CHIME/Pulsar And CHIME/FRB. Invited talk at the UBC Astronomy Colloquium (2020)

Talks - submitted

Fengqiu Adam Dong - With great telescope power comes great pulsar hunting responsibilities and a look towards the future - TomFest (2023)
Fengqiu Adam Dong - With great telescope power comes great pulsar hunting responsibilities - The Canadian Astronomical Society AGM (2023)
Fengqiu Adam Dong - Galactic Pulsar Discoveries using the CHIME/FRB and CHIME/Pulsar instruments. The American Astronomical Society AGM Winter session(2023)
Fengqiu Adam Dong - Identifying FRB repeater candidates with CHIME/FRB using unsupervised machine learning. The International Astronomical Union General Assembly (2022)
Fengqiu Adam Dong - Finding new galactic sources with CHIME/Pulsar And CHIME/FRB. TRU American Physical Society NW Conference (2020)
Fengqiu Adam Dong - Discovery of new Pulsars with CHIME/Pulsar - The Canadian Astronomical Society Anual General Meeting (2020)
V. S. Afshar, S. Atakaramians, **F. Dong** ... - Purcell Effect of Magnetic Dipoles in Nanofibers in 2017 European Conference on Lasers and Electro-Optics and European Quantum Electronics Conference, (Optical Society of America, 2017), paper CK P 6.
S. V. Afshar, **F. Q. Dong** ... - Symmetry breaking in directional coupling to radiation modes of a nanofiber by dipole emission in Advanced Photonics 2018 (BGPP, IPR, NP, NOMA, Sensors, Networks, SPPCom, SOF), OSA Technical Digest (online) (Optical Society of America, 2018), paper JTu5A.18.

Successful proposals (Telescope and others as PI)

The Neil Gehrels Swift Observatory	Granted 32 kiloseconds
Green Bank Telescope (GBT)	Granted 32 hours
upgraded Giant Metrewave telescope (uGMRT)	Granted 12 hours
Sockeye Supercomputing Allocation	fair share access to CPU nodes and 5 TB of project storage

Honours and Awards

ALMA Ambassador Fellowship ($10,000)	(2023)
The University of British Columbia Four Year Fellowship ($106,000)	(2020-2024)
McGill Physics Hackathon 2nd place two years running ($400)	(2020,2021)
University of Auckland Research Scholarship ($4,000)	(2017)
Sydney University Research Scholarship ($4,000)	(2017)
Dodd-Walls masters scholarship - declined ($10,000)	(2017)

Master of Astronomy and Astrophysics Advanced Scholarship ANU - declined ($10,000)	(2017)
First in Class University of Auckland Condensed Matter ($0)	(2016)
Australian National University Research Scholarship ($4,000)	(2015)
President of the University of Auckland Badminton Club ($4,000)	(2013)

Media

Radio Interview on Global News. "Astronomers double the number of cosmic probes"
https://podcasts.apple.com/ca/podcast/ubc-space-study-involves-cosmic-probes/id1593658246?i=1000611197908
Glacier media outlets. "Astronomers double the number of cosmic probes"
https://www.vancouverisawesome.com/highlights/bc-telescope-discovers-25-repeating-radio-signals-from-deep-space-6914265

Related activities

Organized and ran ALMA workshops (proposal and data processing)	2023
Served on the Canadian Astronomical Society Graduate Student Committee	2020-present
Served on NRAO committee for science funding	2023
Served on LOC of the Canadian Astronomical Society AGM	2023

References

Prof. Ingrid Stairs, stairs@astro.ubc.ca
Department of Physics and Astronomy, University of British Columbia
6224 Agricultural Road
Vancouver, BC V6T 1Z1
Canada

Prof. Victoria Kaspi, vkaspi@physics.mcgill.ca
McGill University, Trottier Space Institute
Department of Physics-Rutherford Physics Building, McGill University
3600 University St., Montreal, QC H3A 2T8
Canada

Prof. Paul Scholz, pscholz@yorku.ca
York University, Department of Physics and Astronomy
4700 Keele St, Toronto, ON M3J 1P3
Canada

Publications

First Author or Major Contributions

1. **F.A. Dong** et al. "Constraining the selection corrected luminosity function and total burst count for radio transients". Submission to The Astrophysical Journal in Dec 2023
   I developed the technique and applied the technique to 3 pulsars. I wrote the paper.

2. **F.A. Dong** et al. "A new long period transient discovered by CHIME/FRB and CHIME/Pulsar". Submission to The Astrophysical Journal Letters in Dec 2023
   I discovered the new source, performed the analysis, and wrote the paper.

3. The CHIME/FRB Collaboration incl **F.A. Dong** "CHIME/FRB Discovery of 25 Repeating Fast Radio Burst Sources". In: The Astrophysical Journal 947.2 (2023), p. 83. doi: 10.3847/1538-4357/acc6c1. url: https://dx.doi.org/10.3847/1538-4357/acc6c1.
   I developed the pipeline at the core of the repeating FRB identification process

4. **F.A. Dong** et al. "The second set CHIME/FRB/Pulsar pulsar discoveries: 14 Rotating Radio Transients and 7 pulsars". In: The Monthly Notices of the Royal Society (2023). doi: https://doi.org/10.1093/mnras/stad2012.
   I found the majority of the new sources, performed the analysis and wrote the paper

5. **F.A. Dong** and The CHIME/FRB/Pulsar Collaboration. "CHIME/FRB Detection of a Bright Radio Burst from SGR 1935+2154". In: Astronomers telegram (2022). url: https://www.astronomerstelegorg/?read=15681.
   I wrote some of the telegram and gathered the information by performing analysis for the telegram.

6. **F.A. Dong** et al. "Nonreciprocity in Optical Fiber Radiation Modes Induced by Spin-Momentum Locking". In: Journal of Optics and Laser Technology (2022). doi: 10.2139/ssrn.4159885. url:
   https://doi.org/10.2139%2Fssrn.4159885.
   I wrote the simulation code, performed the simulation and wrote the paper.

7. Marcus Merryfield, ... **F.A. Dong**, et al. "An Injection System for the CHIME/FRB Experiment". In: (2022). doi: 10.48550/ARXIV.2206.14079. url: https://arxiv.org/abs/2206.14079.
   I led the detection portion of the two-part injections pipeline

8. D. C. Good, ... **F. A. Dong**, et al. "First Discovery of New Pulsars and RRATs with CHIME/FRB". In: The Astrophysical Journal 922.1 (Nov. 2021), p. 43. doi: 10.3847/1538-4357/ac1da6. url: https://doi.org/10.3847%2F1538-4357%2Fac1da6.
   I made simulations to predict the total expected amount of pulsars CHIME will detect

9. Shaghik Atakaramians, **F.A., Dong**, et al. "Radiated and guided optical waves of a magnetic dipole-nanofiber system". In: Scientific Reports 9.1 (2019), pp. 1–10. issn: 20452322. doi: 10.1038/s41598-018-38115-z
   I led theory development and the subsequent code writing for the theory.

Other publications

All publications here include **F.A. Dong**. My contribution towards these publications revolves around ensuring the CHIME/FRB and CHIME/Pulsar instruments are operational 24/7. I lead the development and maintenance of the L2/L3 pipeline and the RFI sifter, both indispensable for CHIME/FRB. Bibliography sorted by year, name, title.

[1] Bridget C. Andersen, Emmanuel Fonseca, et al. "CHIME Discovery of a Binary Pulsar with a Massive Nondegenerate Companion". In: *The Astrophysical Journal* 943 (1 Jan. 2023), p. 57. ISSN: 0004-637X. DOI: 10.3847/1538-4357/aca485.

[2] Tomas Cassanelli, Calvin Leung, et al. "A fast radio burst localized at detection to a galactic disk using very long baseline interferometry". In: (July 2023).

[3] Amanda M. Cook, Mohit Bhardwaj, et al. "An FRB Sent Me a DM: Constraining the Electron Column of the Milky Way Halo with Fast Radio Burst Dispersion Measures from CHIME/FRB". In: *The Astrophysical Journal* 946 (2 Apr. 2023), p. 58. ISSN: 0004-637X. DOI: 10.3847/1538-4357/acbbd0.

[4] Utkarsh Giri, Bridget C. Andersen, et al. "Comprehensive Bayesian analysis of FRB-like bursts from SGR 1935+2154 observed by CHIME/FRB". In: (Oct. 2023).

[5] Hsiu-Hsien Lin, Paul Scholz, et al. "Constraints on the Intergalactic and Local Dispersion Measure of Fast Radio Bursts with the CHIME/FRB far side-lobe events". In: (July 2023).

[6] R. Mckinven, B. M. Gaensler, et al. "A Large-scale Magneto-ionic Fluctuation in the Local Environment of Periodic Fast Radio Burst Source FRB 20180916B". In: *The Astrophysical Journal* 950 (1 June 2023), p. 12. ISSN: 0004-637X. DOI: 10.3847/1538-4357/acc65f.

[7] Daniele Michilli, Mohit Bhardwaj, et al. "Subarcminute Localization of 13 Repeating Fast Radio Bursts Detected by CHIME/FRB". In: *The Astrophysical Journal* 950 (2 June 2023), p. 134. ISSN: 0004-637X. DOI: 10.3847/1538-4357/accf89.

[8] Aaron B. Pearlman, Paul Scholz, et al. "Multiwavelength Constraints on the Origin of a Nearby Repeating Fast Radio Burst Source in a Globular Cluster". In: (Aug. 2023).

[9] Ketan R. Sand, Daniela Breitman, et al. "A CHIME/FRB Study of Burst Rate and Morphological Evolution of the Periodically Repeating FRB 20180916B". In: *The Astrophysical Journal* 956 (1 Oct. 2023), p. 23. ISSN: 0004-637X. DOI: 10.3847/1538-4357/acf221.

[10] P. Chawla, V. M. Kaspi, et al. "Modeling Fast Radio Burst Dispersion and Scattering Properties in the First CHIME/FRB Catalog". In: *The Astrophysical Journal* 927.1 (Mar. 2022), p. 35. DOI: 10.3847/1538-4357/ac49e1. URL: https://doi.org/10.3847/1538-4357/ac49e1.

[11] Alice P. Curtin, Shriharsh P. Tendulkar, et al. *Limits on Fast Radio Burst-like Counterparts to Gamma-ray Bursts using CHIME/FRB*. 2022. DOI: 10.48550/ARXIV.2208.00803. URL: https://arxiv.org/abs/2208.00803.

[12] Zarif Kader, Calvin Leung, et al. "A High-Time Resolution Search for Compact Objects using Fast Radio Burst Gravitational Lens Interferometry with CHIME/FRB". In: (2022). DOI: 10.48550/ARXIV.2204.06014. URL: https://arxiv.org/abs/2204.06014.

[13] Zarif Kader, Calvin Leung, et al. "High-time resolution search for compact objects using fast radio burst gravitational lens interferometry with CHIME/FRB". In: *Physical Review D* 106 (4 Aug. 2022), p. 043016. ISSN: 2470-0010. DOI: 10.1103/PhysRevD.106.043016.

[14] Adam E. Lanman, Bridget C. Andersen, et al. "A Sudden Period of High Activity from Repeating Fast Radio Burst 20201124A". In: *The Astrophysical Journal* 927.1 (Mar. 2022), p. 59. DOI: 10.3847/1538-4357/ac4bc7. URL: https://doi.org/10.3847%2F1538-4357%2Fac4bc7.

[15] Calvin Leung, Zarif Kader, et al. "Constraining Primordial Black Holes using Fast Radio

Burst Gravitational-Lens Interferometry with CHIME/FRB". In: (2022). DOI: 10.48550/ARXIV.2204.06001. URL: https://arxiv.org/abs/2204.06001.

[16] Calvin Leung, Zarif Kader, et al. "Constraining primordial black holes using fast radio burst gravitational-lens interferometry with CHIME/FRB". In: *Physical Review D* 106 (4 Aug. 2022), p. 043017. ISSN: 2470-0010. DOI: 10.1103/PhysRevD.106.043017.

[17] R. Mckinven, B. M. Gaensler, et al. *A Large Scale Magneto-ionic Fluctuation in the Local Environment of Periodic Fast Radio Burst Source, FRB 20180916B*. 2022. DOI: 10.48550/ARXIV.2205.09221. URL: https://arxiv.org/abs/2205.09221.

[18] E. Parent, H. Sewalls, et al. "Study of 72 Pulsars Discovered in the PALFA Survey: Timing Analysis, Glitch Activity, Emission Variability, and a Pulsar in an Eccentric Binary". In: *The Astrophysical Journal* 924 (2 Jan. 2022), p. 135. ISSN: 0004-637X. DOI: 10.3847/1538-4357/ac375d.

[19] Kaitlyn Shin, Kiyoshi W. Masui, et al. *Inferring the Energy and Distance Distributions of Fast Radio Bursts using the First CHIME/FRB Catalog*. 2022. DOI: 10.48550/ARXIV.2207.14316. URL: https://arxiv.org/abs/2207.14316.

[20] The CHIME/FRB Collaboration. "Sub-second periodicity in a fast radio burst". In: *Nature* 607.7918 (July 2022), pp. 256–259. DOI: 10.1038/s41586-022-04841-8. URL: https://doi.org/10.1038%2Fs41586-022-04841-8.

[21] E. Fonseca, H. T. Cromartie, et al. "Refined Mass and Geometric Measurements of the High-mass PSR J07406620". In: *The Astrophysical Journal Letters* 915.1 (July 2021), p. L12. DOI: 10.3847/2041-8213/ac03b8. URL: https://doi.org/10.38472F2041-82132Fac03b8.

[22] Ziggy Pleunis, Deborah C. Good, et al. "Fast Radio Burst Morphology in the First CHIME/FRB Catalog". In: *The Astrophysical Journal* 923.1 (Dec. 2021), p. 1. DOI: 10.3847/1538-4357/ac33ac. URL: https://doi.org/10.3847%2F1538-4357%2Fac33ac.

[23] Masoud Rafiei-Ravandi, Kendrick M. Smith, et al. "CHIME/FRB Catalog 1 Results: Statistical Cross-correlations with Large-scale Structure". In: *The Astrophysical Journal* 922.1 (Nov. 2021), p. 42. DOI: 10.3847/1538-4357/ac1dab. URL: https://doi.org/10.3847%2F1538-4357%2Fac1dab.

[24] The CHIME/FRB Collaboration. "The First CHIME/FRB Catalog". In: *The Astrophysical Journal Supplement Series* 257.2 (Dec. 2021), p. 59. DOI: 10.3847/1538-4365/ac33ab. URL: https://doi.org/10.3847%2F1538-4365%2Fac33ab.

[25] P. Chawla, B. C. Andersen, et al. "Detection of Repeating FRB 180916.J0158+65 Down to Frequencies of 300 MHz". In: *The Astrophysical Journal* 896.2 (2020), p. L41. ISSN: 2041-8213. DOI: 10.3847/2041-8213/ab96bf. arXiv: 2004.02862.

[26] E. Fonseca, B. C. Andersen, et al. "Nine New Repeating Fast Radio Burst Sources from CHIME/FRB". In: *The Astrophysical Journal* 891.1 (Feb. 2020), p. L6. ISSN: 2041-8213. DOI: 10.3847/2041-8213/ab7208. URL: https://iopscience.iop.org/article/10.3847/2041-8213/ab7208.

[27] The CHIME/FRB Collaboration. "A bright millisecond-duration radio burst from a Galactic magnetar". In: *Nature* 587.7832 (2020), pp. 54–58. ISSN: 14764687. DOI: 10.1038/s41586-020-2863-y. arXiv: 2005.10324.

[28] The CHIME/FRB Collaboration. "Periodic activity from a fast radio burst source". In: *Nature* 582.7812 (June 2020), pp. 351–355. ISSN: 14764687. DOI: 10.1038/s41586-020-2398-2. arXiv: 2001.10275.