

# Dongzi Li

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## Appointments

2025-now    Assistant professor  
              Tsinghua University  
2023-2025   Lyman Spitzer, Jr. Fellowship  
              Princeton University  
2020-2023   Sherman Fairchild Physics Prize Fellow  
              Walter Burke Institute for Theoretical Physics, California Institute of Technology

## Education

2016-2021   PhD. Physics (Supervisor: Ue-Li Pen)  
              University of Toronto/ Canadian Institute for Theoretical Astrophysics, Canada  
2015-2016   MSc. Physics (Perimeter Scholar International)  
              University of Waterloo/ Perimeter Institute for Theoretical Physics, Canada  
2011-2015   BSc. Astronomy  
              Nanjing University, China

## Major collaboration

2019-now      CHIME/FRB collaboration  
2020-now      GMRT/FRB collaboration  
2021-now      FAST FRB key project

## Selected Presentations

2025    Extreme Physics of Neutron Star Interiors (**invited**)  
2025    SCEECs seminar (**invited**)  
2024    Colloquium at Cornell University (**invited**)  
2024    Stanford/KIPAC workshop: Fields, flows, and filaments in the magnetic ISM (**invitation-only**)  
2024    Shanghai Jiaotong University seminar (**invited**)  
2023    The 32nd Texas Symposium on Relativistic Astrophysics (**invited**)  
2023    Astrophysics of Fast Radio Bursts II (**invitation-only**)  
2023    Gravity and the Extreme Universe 2023 AGM(**invited**)  
2023    Colloquium at ASIAA (**invited**)  
2023    Columbia University Physics Colloquium (**invited**)  
2023    Johns Hopkins Physics & Astronomy Colloquium (**invited**)  
2022    Cornell FRB meeting (**invitation-only**)  
2022    Purdue University Astro Seminar (**invited**)  
2022    Green Bank Observatory community webinars, virtual (**invited**)  
2022    UChicago KICP seminar (**invited**)  
2021    FRB 2021, virtual  
2021    16th Marcel Grossman Meeting (**invited**)  
2021    Colloquium in ASTRON, Amsterdam, Netherlands (**invited**)  
2020    Fast Radio Burst 2020  
2019    Gravity Meets Plasma Workshop  
2019    Meterwave Sky II, Pune  
2018    Scintillometry Workshop  
2018    The International Pulsar Timing Array Science meeting  
2017    Scintillometry Workshop, Toronto, Canada

## Referee

Journals Nature Astronomy, ApJL, ApJ, MNRAS  
Telescope proposals FAST, GMRT

## Successful Proposals (PI: D. Z. Li):

### MeerKat 2024: 36h Priority B1

Multi-Wavelength Study of Compact Object Populations in Two Globular Clusters

■ **This observation will be scheduled simultaneously with a JWST observation:** "Unveiling the compact object and stellar populations of globular clusters Terzan 5 and Liller 1" (PI: Burge, co-I: D. Z. Li, 34.5 h).

### MeerKat 2023: 60h Priority B1

Studying Extreme Lensing and Magneto-Active Environment in Pulsar Binaries

**FAST (under FAST FRB Key Project): 2023: 6h, 2022: 6h, 2021: 6h**

Searching globular cluster FRBs in M87

### Effelsberg 2022: 24h

High-frequency polarimetry of repeating FRBs in magneto-active environments

**FAST 2021: A (8h) B(12h) C(30h)**

Targeted Observations of Local Universe Fast Radio Bursts

### GMRT DDT 2021:12h

Multi-frequency study of the active Repeating FRB20201124A and associated persistent radio source

### VLBA DDT 2021:6h

VLBA milliarcsecond localization of FRB 20201124A

### GMRT 2021: 24h

Constraining models of the Repeating FRB 180916.J0158+65 with Polarization

### Parkes 2019 OCT: 8h

Testing models of interstellar scintillation with the Vela pulsar

### GMRT 2017: 6h

Probing Differential Faraday Rotation of Vela

- **Co-I** on hundreds of hours of proposals from GMRT, GBT, Arecibo, Parkes, FAST, MeerKat and JWST.
- **Instrumental:** 2016-2020 Visit Algonquin radio telescope three times a year, debugging/installing feeds.

## Supervising Experience

### Graduate students:

- 2024-now Nick Loudas (Princeton) *Modeling the FRB host galaxy distribution*  
Co-supervise with Michael Strauss
- 2024-now Yixuan Shao (Nanjing U) *Pipeline for identifying FRBs in unique magneto-environments*
- 2021-now Suryarao Bethapudi(MPIfR) *Polarization properties of the periodic FRB*

### Undergrads/Masters:

- 2023-2024 Xamder Jenkin (Princeton) *Searching Nearby FRBs*
- 2023 Nadja A. Quinones(U Puerto Rico) *Identifying FRBs in unique magneto-environments*
- 2018-2021 Akanksha Bij (U of T) *Kinematics of Crab Giant Pulses*  
Co-supervised with Dr. Hsiu-hsien Lin and Prof. Marten van Kerkwijk
- 2019 Hengrui Zhu (Oberlin College) *VLBI Study of Vela Pulsar*
- 2018 Kayenta Schmidt (U of T) *Searching De-polarization from Crab Giant Pulse*
- 2017-2018 Steven Ufkes (U of T, master) *Toeplitz Matrix De-convolution Algorithm*  
Co-supervised with prof. Ue-Li Pen
- 2016 Visal Sok (U of T) *Toeplitz Matrix De-convolution Algorithm*

## Organizing Events

- 2024 Scintillometry Workshop (SOC)
- 2024-2025 Princeton/IAS Joint Astrophysics Colloquium
- 2023-2024 TAPIR seminar
- 2021-2022 Caltech Theorist/Observer Pizza Lunch
- 2022-2023 Caltech FRB reading group
- 2019 Scintillometry Workshop (SOC)
- 2018-2019 CITA seminar-p-0jhsd
- 2017 Scintillometry Workshop (LOC)
- 2016 CITA-PI Day Workshop

## Teaching/Outreach

2025	Astronomy on Tap	Radio transient
2022	Public talk: Youtube/Weibo	Fast radio bursts
2022	Host of Astronomy on Tap	Special Events Dedicated to JWST
2020	Guest in Podcast	Pythagorean Astronomy: Mass Gaps and Radio Bursts
2020	Guest lecture: 30 students	Application of Radio Propagation Effects
2019	Public talk: 50 audiences	Sensing hidden signals with pulsars
2019	Tutorial: 50 students	Electricity and Magnetism
2018	Online tutorial: 40 students	Physics of Music
2016-2017	Lab demonstrator: 30 students	Introduction to physics
2012	Summer voluntary teacher	Math and English for rural high school students

## Major contribution (including 2 Nature, in total 586 citations. \* student paper)

- [1] **D. Z. Li**, K. J. Lee & Y. P. Yang, et al. **2024**. Characteristic spectra for polarized propagation effects. *to be submitted to apj*.
- \* [2] S. Bethapudi, **D. Z. Li** & L. G. Spitler. **2024**. Constraining the Origin of FRB Periodicity Using the Position Angle of FRB 20180916B. *to be submitted to apj*.
- [3] (**co-first author** with alphabetic order). P. Kempster, **D. Z. Li**, D. B. Fielding, et al. **2024**. A Unified Model of Cosmic Ray Propagation and Radio Extreme Scattering Events from Intermittent Interstellar Structures. *arXiv e-prints*, arXiv:2412.03649. arXiv: 2412.03649 [astro-ph.HE].
- \* [4] S. Bethapudi, L. G. Spitler, **D. Z. Li**, et al. **2024**. Rotation Measure study of FRB 20180916B with the uGMRT. *arXiv e-prints*, arXiv:2409.12584. arXiv: 2409.12584 [astro-ph.HE].
- [5] **D. Z. Li** & U.-L. Pen. **2024**. FRBs from rapid spin-down neutron stars. *Mon. Not. R. Astron. Soc.* **531**, 2330–2334. arXiv: 2309.06328 [astro-ph.HE].
- [6] **D. Z. Li**, A. Bilous, S. Ransom, et al. **2023**. A highly magnetized environment in a pulsar binary system. *Nature* **618**, 484–488. arXiv: 2205.07917 [astro-ph.HE].
- [7] K. Kremer, **D. Z. Li**, W. Lu, et al. **2023**. Prospects for Detecting Fast Radio Bursts in the Globular Clusters of Nearby Galaxies. *Astrophys. J.* **944**, 6. arXiv: 2210.04907 [astro-ph.HE].
- [8] V. Ravi, C. J. Law, **D. Z. Li**, et al. **2022**. The host galaxy and persistent radio counterpart of FRB 20201124A. *Mon. Not. R. Astron. Soc.* **513**, 982–990. arXiv: 2106.09710 [astro-ph.HE].
- [9] M. Rafiei-Ravandi, K. M. Smith, **D. Z. Li**, et al. **2021**. CHIME/FRB Catalog 1 Results: Statistical Cross-correlations with Large-scale Structure. *Astrophys. J.* **922**, 42. arXiv: 2106.04354 [astro-ph.CO].
- \* [10] A. Bij, H.-H. Lin, **D. Z. Li**, et al. **2021**. Kinematics of Crab Giant Pulses. *Astrophys. J.* **920**, 38. arXiv: 2105.08851 [astro-ph.HE].
- [11] **D. Z. Li** & J. J. Zanazzi. **2021**. Emission Properties of Periodic Fast Radio Bursts from the Motion of Magnetars: Testing Dynamical Models. *Astrophys. J. Letters* **909**, L25. arXiv: 2101.05836 [astro-ph.HE].
- [12] (**D. Z. Li** as the corresponding author). Chime/Frb Collaboration, M. Amiri, B. C. Andersen, et al. **2020**. Periodic activity from a fast radio burst source. *Nature* **582**, 351–355. arXiv: 2001.10275 [astro-ph.HE].
- [13] **D. Z. Li**, H.-M. Zhu & U.-L. Pen. **2019**. Cross-correlation of the kinematic Sunyaev-Zel'dovich effect and 21 cm intensity mapping with tidal reconstruction. *Phys. Rev. D* **100**, 023517. arXiv: 1811.05012 [astro-ph.CO].
- [14] **D. Z. Li**, F. X. Lin, R. Main, et al. **2019**. Constraining magnetic fields through plasma lensing: application to the Black Widow pulsar. *Mon. Not. R. Astron. Soc.* **484**, 5723–5733. arXiv: 1809.10812 [astro-ph.HE].
- [15] **D. Z. Li**, A. Yalinewich & P. C. Breysse. **2019**. Statistical inference of the distance to ASKAP FRBs. *arXiv e-prints*, arXiv:1902.10120. arXiv: 1902.10120 [astro-ph.HE].

## Contributed (including 6 Nature, in total 3135 citations)

- [16] C. Ng, A. Pandhi, R. Mckinven, et al. **2024**. Polarization properties of 28 repeating fast radio burst sources with CHIME/FRB. *arXiv e-prints*, arXiv:2411.09045. arXiv: 2411.09045 [astro-ph.HE].
- [17] J. C. Jiang, J. W. Xu, J. R. Niu, et al. **2024**. Ninety percent circular polarization detected in a repeating fast radio burst. *arXiv e-prints*, arXiv:2408.03313. arXiv: 2408.03313 [astro-ph.HE].
- [18] Z. Wu, W. Zhu, B. Zhang, [...], **D. Z. Li**, et al. **2024**. Scintillation Velocity and Arc Observations of FRB 20201124A. *Astrophys. J. Letters* **969**, L23. arXiv: 2406.12218 [astro-ph.HE].
- [19] K. Nimmo, Z. Pleunis, P. Beniamini, et al. **2024**. Magnetospheric origin of a fast radio burst constrained using scintillation. *arXiv e-prints*, arXiv:2406.11053. arXiv: 2406.11053 [astro-ph.HE].
- [20] A. Pandhi, Z. Pleunis, R. Mckinven, [...], **D. Z. Li**, et al. **2024**. Polarization Properties of 128 Nonrepeating Fast Radio Bursts from the First CHIME/FRB Baseband Catalog. *Astrophys. J.* **968**, 50. arXiv: 2401.17378 [astro-ph.HE].
- [21] M. Rafiei-Ravandi, K. M. Smith, D. Michilli, [...], **D. Z. Li**, et al. **2024**. Statistical Association between the Candidate Repeating FRB 20200320A and a Galaxy Group. *Astrophys. J.* **961**, 177. arXiv: 2308.09608 [astro-ph.GA].
- [22] R. Mckinven, M. Bhardwaj, T. Eftekhari, [...], **D. Z. Li**, et al. **2024**. A pulsar-like swing in the polarisation position angle of a nearby fast radio burst. *arXiv e-prints*, arXiv:2402.09304. arXiv: 2402.09304 [astro-ph.HE].
- [23] Z.-W. Wu, R. A. Main, W.-W. Zhu, et al. **2024**. Scintillation Arc from FRB 20220912A. *Science China Physics, Mechanics, and Astronomy* **67**, 219512. arXiv: 2304.14697 [astro-ph.HE].
- [24] C.-C. Miao, V. Blackmon, W.-W. Zhu, et al. **2023**. Reciprocating Magnetic Fields in the Pulsar Wind Observed from the Black Widow Pulsar J1720-0534. *Research in Astronomy and Astrophysics* **23**, 105005. arXiv: 2307.00731 [astro-ph.HE].
- [25] Y.-K. Zhang, D. Li, B. Zhang, et al. **2023**. FAST Observations of FRB 20220912A: Burst Properties and Polarization Characteristics. *Astrophys. J.* **955**, 142. arXiv: 2304.14665 [astro-ph.HE].
- [26] S. Bethapudi, L. G. Spitler, R. A. Main, et al. **2023**. High frequency study of FRB 20180916B using the 100-m Effelsberg radio telescope. *Mon. Not. R. Astron. Soc.* **524**, 3303–3313. arXiv: 2207.13669 [astro-ph.HE].
- [27] S. Q. Wang, J. B. Wang, D. Z. Li, et al. **2023**. Change of Rotation Measure during the Eclipse of a Black Widow PSR J2051-0827. *Astrophys. J.* **955**, 36. arXiv: 2307.13198 [astro-ph.HE].
- [28] H.-H. Lin, P. Scholz, C. Ng, [...], **D. Z. Li**, et al. **2023**. Do All Fast Radio Bursts Repeat? Constraints from CHIME/FRB Far Side-Lobe FRBs. *arXiv e-prints*, arXiv:2307.05261. arXiv: 2307.05261 [astro-ph.HE].
- [29] R. Mckinven, B. M. Gaensler, D. Michilli, et al. **2023**. Revealing the Dynamic Magnetoionic Environments of Repeating Fast Radio Burst Sources through Multiyear Polarimetric Monitoring with CHIME/FRB. *Astrophys. J.* **951**, 82. arXiv: 2302.08386 [astro-ph.HE].
- [30] H.-H. Lin, P. Scholz, C. Ng, et al. **2023**. Constraints on the Intergalactic and Local Dispersion Measure of Fast Radio Bursts with the CHIME/FRB far side-lobe events. *arXiv e-prints*, arXiv:2307.05262. arXiv: 2307.05262 [astro-ph.HE].
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- [33] R. A. Main, S. Bethapudi, V. R. Marthi, et al. **2023**. Modelling annual scintillation velocity variations of FRB 20201124A. *Mon. Not. R. Astron. Soc.* **522**, L36–L41. arXiv: 2212.04839 [astro-ph.HE].
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- [35] J.-C. Jiang, W.-Y. Wang, H. Xu, et al. **2022**. FAST Observations of an Extremely Active Episode of FRB 20201124A. III. Polarimetry. *Research in Astronomy and Astrophysics* **22**, 124003. arXiv: 2210.03609 [astro-ph.HE].

- [36] J.-R. Niu, W.-W. Zhu, B. Zhang, et al. **2022**. FAST Observations of an Extremely Active Episode of FRB 20201124A. IV. Spin Period Search. *Research in Astronomy and Astrophysics* **22**, 124004. arXiv: 2210.03610 [astro-ph.HE].
- [37] Y. Zhang, J. Niu, Y. Feng, [...], **D. Z. Li**, et al. **2022**. FAST detection of high activity FRB 20220912A. *The Astronomer's Telegram* **15733**, 1.
- [38] H. Xu, J. R. Niu, P. Chen, et al. **2022**. A fast radio burst source at a complex magnetized site in a barred galaxy. *Nature* **609**, 685–688. arXiv: 2111.11764 [astro-ph.HE].
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- [41] T. Cassanelli, C. Leung, M. Rahman, [...], **D. Z. Li**, et al. **2022**. Localizing FRBs through VLBI with the Algonquin Radio Observatory 10 m Telescope. *Astron. J.* **163**, 65. arXiv: 2107.05659 [astro-ph.IM].
- [42] F. Kirsten, B. Marcote, K. Nimmo, et al. **2022**. A repeating fast radio burst source in a globular cluster. *Nature* **602**, 585–589. arXiv: 2105.11445 [astro-ph.HE].
- [43] R. A. Main, G. H. Hilmarsson, V. R. Marthi, et al. **2022**. Scintillation time-scale measurement of the highly active FRB20201124A. *Mon. Not. R. Astron. Soc.* **509**, 3172–3180. arXiv: 2108.00052 [astro-ph.HE].
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