Amogh Anakru

Department of Physics, Penn State University
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Research Interests

Strongly correlated quantum matter, quantum field theory in many-body systems, generalized symmetries, tensor networks

Education

Ph.D. in Physics Aug 2021 – May 2027 (expected)
Penn State University
Advisor: Prof. Zhen Bi
GPA: 3.86
Passed Comprehensive Examination: August 18, 2023

B.S. in Engineering Physics (with Honors) Aug 2017 – May 2021
Cornell University
Minors: Mathematics; Applied Mathematics
GPA: 3.89

Publications and Preprints

[1] Amogh Anakru and Zhen Bi. Non-fermi liquids from dipolar symmetry breaking. *Phys. Rev. B*, 108:165112, Oct 2023.

[2] Amogh Anakru and Zhen Bi. Topological phases and phase transitions with dipolar symmetry breaking. *arXiv preprint arXiv:2403.19601*, 2024.

[3] Amogh Anakru, Mytraya Gattu, Ajit C. Balram, Xiao-Chuan Wu, Prashant Kumar, Zhen Bi, and J. K. Jain. Emergent gauge field in composite-fermion metals: A large-scale microscopic study. *Phys. Rev. Lett.*, 135:246503, Dec 2025.

[4] Amogh Anakru, Linhao Li, and Zhen Bi. An intrinsically gapless topological phase with dipole symmetry. in progress.

[5] Amogh Anakru, Sarvesh Srinivasan, Linhao Li, and Zhen Bi. Matrix product states for modulated symmetries: Spt, lsm, and beyond. *arXiv preprint arXiv:2603.19189*, 2026.

[6] D. Cesar, A. Anakru, S. Carbajo, J. Duris, P. Franz, S. Li, N. Sudar, Z. Zhang, and A. Marinelli. Electron beam shaping via laser heater temporal shaping. *Phys. Rev. Accel. Beams*, 24:110703, Nov 2021.

Activities and Conferences

- Kavli Institute for Theoretical Physics Graduate Fellowship (Fall 2026)
- Boulder Summer School (2025).
- Prospects in Theoretical Physics (2024).
- Princeton Summer School in Condensed Matter Physics (2023).

Contributed Talks

- Gapless Topological Phases and Lifshitz Criticality in 1-D Dipole-Conserving Fermionic Chains, APS Global Physics Summit (2025).
- Quantum Hall Phases from Dipolar Symmetry Breaking, APS March Meeting (2024).
- Non-Fermi Liquid Phase from Dipole Symmetry, APS March Meeting (2023).

Technical Skills

Programming: Julia, Matlab, Fortran
Methods: Tensor Networks (DMRG)

Teaching Experience

Teaching Assistant, Penn State University

- PHYS 419 (Theoretical Mechanics) – Spring 2026
- PHYS 211 (General Physics: Mechanics) – Spring 2022, Spring 2025
- PHYS 212 (General Physics: E & M) – Fall 2022, Spring 2024