

# Zehao Dong

PhD Candidate in Physics, Tsinghua University



## Contact

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## Technical Skills

- Electron microscopy; 2D heterostructure fabrication; cryogenic transport
- MATLAB, Python
- Languages: English (Fluent)

## Summary

I am currently focusing on strongly correlated materials, particularly high-temperature superconductors. My previous research involved using scanning tunneling microscopy (STM) and tunneling spectroscopy to investigate their electronic properties. Currently, I am developing novel computational imaging techniques for scanning transmission electron microscopy (STEM) and applying them to visualize local structural defects in quantum materials.

## Research Interests

- High-temperature superconductivity (cuprates and nickelates)
- Scanning transmission electron microscopy (atomic-scale structure/defect imaging)
- Electron ptychography (GPU-accelerated phase retrieval)

## Education

- 2022–present Graduate student in Physics, Department of Physics, Tsinghua University
- 2018–2022 B.Sc. in Physics, School of Physics, Peking University

## Honors & Awards

- 2023 Best Oral Presentation Award, The 20th International Microscopy Congress (IMC)
- 2018 Gold Medalist, The 49th International Physics Olympiad (IPhO)

## Selected First-Author / Co-First Publications

1. **Dong, Z.**; et al. “Interstitial oxygen order and its competition with superconductivity in  $\text{La}_2\text{PrNi}_2\text{O}_{7+\delta}$ .” *Nature Materials* (to be published, 2025).
2. **Dong, Z.**; Zhang, Y.; Chiu, C.-C.; Lu, S.; Zhang, J.; Liu, Y.-C.; Liu, S.; Yang, J.-C.; Yu, P.; Wang, Y.; Chen, Z.\* “Sub-nanometer depth resolution and single dopant visualization achieved by tilt-coupled multislice electron ptychography.” *Nature Communications* 16, 1219 (2025).
3. **Dong, Z.**†; Huo, M.†; Li, J.†; Li, J.; Li, P.; Sun, H.; Gu, L.; Lu, Y.\*; Wang, M.\*; Wang, Y.\*; Chen, Z.\* “Visualization of oxygen vacancies and self-doped ligand holes in  $\text{La}_3\text{Ni}_2\text{O}_{7-\delta}$ .” *Nature* 630, 847–852 (2024).
4. Ji, Y.†; **Dong, Z.**†; Wang, H.; Li, Q.; Ye, S.; Gao, Z.; Hao, Z.; Wang, Y.\* “Magnetic field orientation dependence of planar tunneling spectroscopy in the superconducting state of  $\text{NbSe}_2$ .” *Quantum Frontiers* 2, 5 (2023).