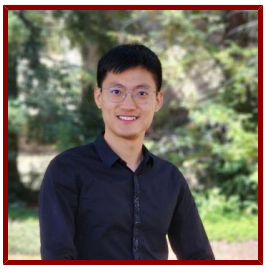
Stanford



Dali Cheng

Ph.D. Student in Electrical Engineering, admitted Autumn 2021

Bio

EDUCATION AND CERTIFICATIONS

- B.Eng., Tsinghua University , Electronic Engineering (2020)

LINKS

- LinkedIn: https://www.linkedin.com/in/dali-cheng/
- Google Scholar: https://scholar.google.com/citations?user=yPR28UcAAAAJ

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

A light chaser studying photonics both theoretically and experimentally. I am devoted to understanding and improving our world using photonic science and engineering.

Photonics from physics. I use fundamental physical principles to manipulate light propagation, which potentially enables novel applications in optical devices.

Photonics for physics. I use photonics to emulate physical systems, which improves our understanding of the physical laws that govern the universe.

My current interest includes photonic systems with nontrivial topology, non-Hermiticity, non-Abelian gauge fields, and in the synthetic dimension.

LAB AFFILIATIONS

- Shanhui Fan, Fan group at Ginzton Laboratory (9/20/2021)

Publications

PUBLICATIONS

- **Experimental observation of energy-band Riemann surface.** *Science advances*
  Cheng, D., Wang, H., Zhong, J., Lustig, E., Roques-Carmes, C., Fan, S.
  2026; 12 (12): eaec8239
- **Non-Abelian lattice gauge fields in photonic synthetic frequency dimensions.** *Nature*
  Cheng, D., Wang, K., Roques-Carmes, C., Lustig, E., Long, O. Y., Wang, H., Fan, S.
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- **Experimental observation of non-Abelian lattice gauge fields for photons in synthetic frequency dimensions**
  Cheng, D., Wang, K., Roques-Carmes, C., Lustig, E., Long, O., Wang, H., Fan, S., IEEE
  IEEE.2025
- **Eigenenergy braids in two-dimensional photonic crystals**
  Zhong, J., Wojcik, C. C., Cheng, D., Fan, S., IEEE
  IEEE.2024
- **Band structure measurements in multi-dimensional synthetic frequency lattices**
  Cheng, D., Lustig, E., Wang, K., Fan, S., IEEE
  IEEE.2024
- **Numerical and theoretical study of eigenenergy braids in two-dimensional photonic crystals** *PHYSICAL REVIEW B*
  Zhong, J., Wojcik, C. C., Cheng, D., Fan, S.
  2023; 108 (19)
- **Multi-dimensional band structure spectroscopy in the synthetic frequency dimension.** *Light, science & applications*
  Cheng, D., Lustig, E., Wang, K., Fan, S.
  2023; 12 (1): 158
- **Artificial Non-Abelian Lattice Gauge Fields for Photons in the Synthetic Frequency Dimension.** *Physical review letters*
  Cheng, D., Wang, K., Fan, S.
  2023; 130 (8): 083601
- **Optical Neural Network Architecture for Deep Learning with Temporal Synthetic Dimension** *CHINESE PHYSICS LETTERS*
  Peng, B., Yan, S., Cheng, D., Yu, D., Liu, Z., Yakovlev, V. V. V., Yuan, L., Chen, X.
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- **Technologically feasible quasi-edge states and topological Bloch oscillation in the synthetic space** *OPTICS EXPRESS*
  Wu, X., Wang, L., Li, G., Cheng, D., Yu, D., Zheng, Y., Yakovlev, V. V., Yuan, L., Chen, X.
  2022; 30 (14): 24924-24935
- **Truncation-dependent PT phase transition for the edge states of a two-dimensional non-Hermitian system** *PHYSICAL REVIEW B*
  Cheng, D., Peng, B., Xiao, M., Chen, X., Yuan, L., Fan, S.
  2022; 105 (20)
- **Low temperature open-air plasma deposition of amorphous tin oxide for perovskite solar cells** *THIN SOLID FILMS*
  Zhao, O., Ding, Y., Cheng, D., Zhang, J., Hilt, F., Rolston, N., Jiang, G., Dauskardt, R. H.
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- **Arbitrary synthetic dimensions via multiboson dynamics on a one-dimensional lattice** *PHYSICAL REVIEW RESEARCH*
  Cheng, D., Peng, B., Wang, D., Chen, X., Yuan, L., Fan, S.
  2021; 3 (3)