Qingqing Zhao

Curriculum Vitae

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Education

since 09/20   **Ph.D. Student in Electrical Engineering**, *Stanford University, Stanford, CA*.
- Advisor: Prof. Gordon Wetzstein, GPA: 4.04

09/18–09/19   **Yale Visiting International Student Program**, Yale University, New Haven, CT.
- GPA 4.0

09/16–05/20   **B.Sc. in Physics**, The University of Hong Kong, HK .
- GPA 4.0

Research Interests

- Integration of **science** and **machine learning** with the focus on:
  - ML-accelerated simulation with Physics guidance
  - ML-powered workflow for design and structure discovery

Research Experience

Since 09/20   **Stanford Computational Imaging Lab**, *Stanford University, Stanford, CA*.
- **Advisor:** Prof. Gordon Wetzstein
- Developed the first deep learning-based model for accurate multi-scale physics simulation.
- Developed a ML-powered workflow for solving time-dependent PDE-constrained inverse problems using Graph Neural Network and Generative AI with higher accuracy and near $100\times$ speedup.
- Developed a general framework for solving nonlinear image processing problems leveraging deep-learning techniques like gradient-based meta-learning and implicit neural representation, etc.

06/22–09/22   **Mitsubishi Electric Research Laboratories**.
- **Host:** Dr. Hassan Mansour
- Developed ML-solution for real-world radar imaging problem for underground imaging with complex background structures.

01/19–09/20   **Miller's Group**, *Department of Applied Physics, Yale University, CT*.
- **Advisor:** Prof. Owen D. Miller
- Developed a computational method for calculating theoretical lower bounds for mode volume under full Maxwell constraints.
- Investigated various convex optimization techniques for calculating theoretical lower bounds for nanophotonics design problems.

07/18–08/18   **RIKEN Research Institute**, Nishina School for Nuclear Physics, Japan.

- Performed activation experiment for 2MeV 12C(p,)13N reaction using RIKEN accelerators and detectors and analyzed the data

06/17–07/18 **Nuclear Physics Lab**, The University of Hong Kong, HK.
- **Advisor:** Prof. Jenny Lee and Dr. Xinxing Xu
- Analyzed the experimental data of 28S using ROOT (a modular scientific software toolkit written in C++) and reconstructed the partial beta-delayed proton emission decay scheme of 28S from the experimental data.
- Utilized GET System (a generic electronics system for nuclear physics instrumentation) to test the energy resolution of the double-sided silicon strip detector (DSSD) and compared with the result obtained from the conventional electronic system.

Publications and Posters

- **Learning Controllable Adaptive Simulation for Multi-scale Physics**, T. Wu*, T. Maruyama*, Q, Zhao*, G. Wetzstein, L. Jure, ICLR 2023, Also in NeurIPS 2022 AI4Science workshop

- **Deep Born Operator Learning for Reflection Tomographic Imaging**, Q. Zhao, Y. Ma, P. T. Boufounos, S. Nabi, H. Mansour, ICASSP 2023 (under review)

- **Learning to solve PDE-constrained inverse problems with graph networks**, Q. Zhao, D. Lindell, G. Wetzstein, ICML2022, Also in ICML 2022 AI4Science workshop

- **Minimum Dielectric-Resonator Mode Volumes,** (under-review: Physical Review Letters) Q. Zhao, L. Zhang and O. D. Miller, https://arxiv.org/abs/2008.13241

- **Computational Bound for Nanophotonics Design,** Q. Zhao, L. Zhang and O. D. Miller, Poster Presentation, Yale Energy Sciences Institute Retreat, New Haven, CT, 2019

- β-**decay spectroscopy of** ^{27}S**,** L. J. Sun et al. (RIBLL Collaboration), Phys. Rev. C 99, 064312, DOI: 10.1103 / PhysRevC.99.064312

Honors & Awards

2016-2020 **HKU Foundation Entrance Scholarship**.
- Scholarship for outstanding freshmen; cover four years' tuition with allowances (USD 24,000/year)

2017-2020 **Dr. P.M. Hui Memorial Scholarship**.
- Scholarship for outstanding student in Physics

2018-2019 **HKU Worldwide Undergraduate Student Exchange Scholarship**.
- Scholarship for study abroad programs at Yale (USD 12,000)

2017-2019 **HKU Summer Research Fellowship**.
- Fellowship for conducting summer research (USD 2,000)

2017-2018 **Li Po Kwai Scholarship**.
- Scholarship for top two sophomores majoring in Physics

2016-2018 **Lam Chi Him Memorial Prize in Physics** .

2016-2018 **Dean's Honors List**.
- for students who are within the top 10% of their class