Yuanshen Li

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Education

2017 – M.Sc. and PhD candidate, Physics, University of Chicago, Illinois

2013 – 2017 B.A. *summa cum laude*, Physics, Carleton College, Minnesota

Current Research

Storage-ring-driven X-ray free electron laser oscillator (XFELO)

- Developing simulation framework for large-scale coherent X-ray generation driven by next generation electron synchrotrons

Cavity-based X-ray free electron laser (CBXFEL) collaboration

- Collaboration is a 5-year, multimillion dollar effort between Argonne National Lab (ANL), Stanford Linear Accelerator Lab (SLAC) and SPring-8 to build the world's first XFELO proof-of-concept
- Contributing heavily to the numerical modeling effort, including developing X-ray cavity simulation from scratch, as well as laying the groundwork for future XFELO machine modeling

Near-surface velocity structure based on seismic body wave polarization and topography

- Developing analytical and numerical model using seismic body wave polarization and topographical slope to determine near-surface Earth velocity structure.

Relevant Skills

- *Non-physics coursework:* Advanced linear algebra, Fourier analysis, group theory and Lie algebras, complex analysis, stochastic processes, machine learning, programming language design
- *Programming:* Proficient in C, Python, and Mathematica; limited experience with R, C++, Java, and Fortran
- *Languages:* English (native), Mandarin Chinese (native), and German (proficient)

Publications

- **Y. S. Li**, R. R. Lindberg, and K.-J. Kim, "Optimization of the Transverse Gradient Undulator (TGU) for Application in a Storage Ring Based XFELO," *Proceedings of FEL2019*, 2019.
- **Y. S. Li**, R. R. Lindberg, and K.-J. Kim, "Axial Symmetry in Spontaneous Undulator Radiation for XFELO Two-bunch Experiment," *Proceedings of FEL2019*, 2019.
- T. Sen, **Y. S. Li**, "Nonlinear theory of transverse beam echoes," *Phys. Rev. ST Accel. Beams*, vol. 21, p. 021002, 2018.
- **Y. S. Li**, "Diffusion measurement from transverse echoes" in *Proceedings of NAPAC2016*, p. 572, 2016.

Awards and Honors

2019 Student Award, FEL Conference

2019 Student Fellowship, US Particle Accelerator School

2017 McCormick Fellowship, University of Chicago

2016 Student Award, North American Particle Accelerator Conference

2016 Lee Teng Fellowship, Fermilab

2013 – 2016 Dean's List, Carleton College

Leadership and Teaching Experience

2017 – **Teaching Assistant/Grader, University of Chicago**
Undergraduate physics (E&M, Mechanics, Complex Systems) and graduate physics (Adv. E&M, Accelerator Physics)

2019 – 2022 **Teaching Assistant, US Particle Accelerator School**
Synchrotron Radiation and Free-electron Lasers course in 2019, 2021, and 2022

2011 – 2013 **Platoon Sergeant, Singapore Armed Forces**
Performed as part of Singapore's mandatory military conscription. Responsibilities include planning and execution of 150-man military exercises, as well as daily management and caretaking of a 30-man platoon