

CHUNYAN LI

Postdoctoral scholar
Department of Mathematics
University of South Carolina
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EDUCATION

Ph.D. <i>Applied Mathematics</i> University of South Carolina - Advisors: Qi Wang - Thesis: Deep Learning for Studying Materials Stability and Solving Thermodynamically Consistent PDEs With Dynamic Boundary Conditions in Arbitrary Domains.	Aug. 2018 – Dec. 2023 Columbia, SC, 29208
B.Sc. <i>Mathematics and Applied Mathematics, Honors Class</i> Xiangtan University	Sep. 2014 - Jun. 2018 Xiangtan, Hunan, China

EMPLOYMENT

Postdoctoral Scholar Department of Mathematics, University of South Carolina	May 2025 - Columbia, SC, 29208
Postdoctoral Scholar Department of Mathematics, The Penn State University	Jan. 2024 - May 2025 State College, PA, 16801

RESEARCH INTERESTS

- Scientific Machine Learning for Partial Differential Equations
- Data-driven Modeling and AI-driven Digital Twins for Biomedical Systems
- Inverse Problems, Data Assimilation, and Uncertainty Quantification
- Numerical Analysis and Scientific Computing

HONORS AND AWARDS

14. SEC Emerging Scholars Fellowship Graduate School, University of South Carolina Only five recipients among all graduate and postdoctoral students are selected in the university.	AY 2022-2023
13. Graduate International Student Achievement Award University of South Carolina Only two international students are awarded each semester, one at the graduate level and one at the undergraduate level	Dec. 2023
12. C.C. Royal Fellowship Graduate School, University of South Carolina C.C. Royal Fellowship is one of the Trustee Fellowships awarded to full-time graduate students who exhibit excellence in graduate study, research, and scholarship. Given annually to one recipient by the Graduate School at the University of South Carolina.	Apr. 2022
11. George W. Johnson Graduate Fellowship Department of Mathematics, University of South Carolina Given annually by the Department of Mathematics at the University of South Carolina, one recipient each year.	Apr. 2020 & May 2022
10. Outstanding First-Year ACM Student Department of Mathematics, University of South Carolina Given annually by the Department of Mathematics at the University of South Carolina, one recipient each year.	Apr. 2019
9. Xiangjiang Scholarship for Excellent Students Department of Mathematics, Xiangtan University Given annually for the top student by the Department of Mathematics at Xiangtan University.	Dec. 2017
8. Advanced Individual of Volunteer Activities Xiangtan University	May 2017
7. Scholarships for excellent students in honors class (4-year tuition fellowship) Xiangtan University	Sep. 2014-Jun. 2018

6. National Encouragement Scholarship	Nov. 2016
Xiangtan University	
• Given annually for the top student by the Department of Mathematics at the Xiangtan University, one recipient each year.	
5. Outstanding Student Cadre	May 2015
Xiangtan University	
4. Second-class scholarship (Top 2/19)	May 2015
Xiangtan University	
3. Outstanding teacher of the MUJIN Volunteer organization,	May 2015
Xiangtan University, China	
2. Undergraduate National Mathematical Contest in Modeling	
• 05/2015, Xiangtan University Third Prize	• 11/2016, Provincial First Prize
• 02/2016, Successful Participant (USA)	• 12/2016, National First Prize
1. National Mathematical Competition of the Math Major Undergraduate Student	
• 11/2016, Provincial First Prize	• 12/2017, Provincial Third Prize
• 11/2016, National Second Prize	

GRANTS AND TRAVEL AWARDS

5. SIAM Early Career Travel Award for the 2026 SIAM Conference on the Life Sciences (LS26) \$1,000	Jul. 2026
4. SPARC Graduate Research Grant \$5,000	May 2023 - Aug. 2024
Only 49 recipients among all graduate students are selected by the office of the Vice President for Research at the University of South Carolina.	
3. Travel Award by the ICERMS at Brown University for Mathematical and Computational Biology	Jun. 2023
2. Travel Award by the ICERMS at Brown University for Mathematical and Scientific Machine Learning	Jun. 2023
1. Travel Award by the 40th SEARCDE Conference \$500	Nov. 2022

TEACHING EXPERIENCE

- **Instructor** at the Penn State University:
 - Spring 2025 - Math/CMPSC 451 Numerical Computations
 - Fall 2024 - MATH 452 **Deep Learning Algorithms and Analysis**
 - Spring 2024 - Math/CMPSC 451 **Numerical Computations**
- **Instructor** at University of South Carolina:
 - Spring 2020 - Math 115, PreCalculus.
- **Recitation Leader** at University of South Carolina:
 - Fall 2025 - Math 242 Ordinary differential equations
 - Fall 2021 - Math 528 **Mathematical Foundation of Data Science and Machine Learning**
 - Fall 2019 - Math 142, Calculus II (2 sections).
 - Spring 2019 / Fall 2020 - Math 141, Calculus I (2 sections).
- **Mentor** at Xiangtan University:
 - Fall 2016 - mentor for class 2 in Department of Mathematics
 - Spring 2017 - mentor for honors class in Business School

Facilitated weekly recitations and discussion sections and designed and administered monthly exams; recruited by the Department of Mathematics to mentor first-year students in Calculus and Linear Algebra.

PUBLICATIONS

In preparation

10. **Chunyan Li**, Xuelong Gu and Qi Wang. Data-driven Parameter Estimation for Flows in Unsaturated Soil Using the Extended Kalman Filter. *In preparation*.
9. **Chunyan Li**, Parwane P. Pagano, and Wenrui Hao. Non-invasive Arterial Blood Pressure Estimation from ECG signals using Random Projection Neural Networks. *In preparation*.
8. Jianguo Hou, Xiang Cao, **Chunyan Li**, Tomoko Goddard, Jihad Obeid, and Qi Wang. Dynamic Laboratory Trajectories for Mortality Prediction in Non-Small Cell Lung Cancer. *In preparation*

Preprints Submitted

7. **Chunyan Li**, Qi Wang. Random Projection Neural Network-Based Methods for Phase Field Models. *Submitted*.

Refereed Journals

6. **Chunyan Li**, Yutong Mao, Xiao Liu, and Wenrui Hao. Data-Driven Modeling of Spatiotemporal Dynamics Using Multimodal Imaging Data. *Accepted for publication in PLOS Computational Biology*. arXiv:2511.08847
5. **Chunyan Li**, Wenkai Yu, and Qi Wang. Energy Dissipation Rate Guided Adaptive Sampling for Physics-Informed Neural Networks: Resolving Surface-Bulk Dynamics in Allen–Cahn Systems. *International Journal of Numerical Analysis and Modeling* **23**(4): 576–604, 2026. doi:10.4208/ijnam2026-1025
4. **Chunyan Li**, Lu Wang, Kexun Li, Hongfei Deng, Yu Wang, Li Chang, Ping Zhou, Jun Zeng, Mingwei Sun, Hua Jiang, and Qi Wang. Machine-learning-enabled Prognostic Models for Sepsis. *Intelligence-Based Medicine* **10**:100167, 2024. doi:10.1016/j.ibmed.2024.100167
3. Jianguo Hou, Jun Deng, **Chunyan Li**, and Qi Wang. Tracing and Forecasting Metabolic Indices of Cancer Patients Using Patient-Specific Deep Learning Models. *Journal of Personalized Medicine* **12**, no. 5 (2022): 742. doi:10.3390/jpm12050742
2. **Chunyan Li**, Shehani T. Wetthasinghe, Huina Lin, Tianyu Zhu, Chuanbing Tang, Vitaly Rassolov, Qi Wang, and Sophya Garashchuk. Stability Analysis of Substituted Cobaltocenium [Bis(cyclopentadienyl)cobalt(III)] Employing Chemistry-Informed Neural Networks. *Journal of Chemical Theory and Computation* **18**, no. 5 (2022): 3099–3110. doi:10.1021/acs.jctc.1c01201
1. Shehani T. Wetthasinghe, **Chunyan Li**, Huina Lin, Tianyu Zhu, Chuanbing Tang, Vitaly Rassolov, Qi Wang, and Sophya Garashchuk. Correlation between the Stability of Substituted Cobaltocenium and Molecular Descriptors. *The Journal of Physical Chemistry A* **126**, no. 1 (2022): 80–87. doi:10.1021/acs.jpca.1c10603

MENTORING EXPERIENCES

University of South Carolina – Columbia, SC, US

Mentor in REU Summer School

Summer 2025

- Lectures on time series classification problem with image encoding methods such as Gramian Angular Fields, Markov Transition Field, Recurrence plots, Fuzzy Recurrence plot, Wavelet Scalograms, etc..
- Meet with 3 undergraduate students every week to update the progress and provide feedback of the applications of image encoding techniques on real medical longitudinal data.

Mentor in REU Summer School

Summer 2022

- Lectures on PyTorch programming.
- Meet with students for at least 2 hours every day to update the research projects for each group (5 undergraduate students in 2 groups).
- Mentor 3 students in group I to learn Neural Ordinary Differential Equation (NODE) and how to program using its package, and guide students to do research on “predicting biomarkers of cancer patients using NODE”.
- Mentor 2 students in group II to learn Physics Informed Neural Network (PINN) and how to program using DeepXDE package and guide students to do research on “solving a Partial Differential Equation using PINN”.

MEMBERSHIPS OF PROFESSIONAL SOCIETIES

Society for Industrial and Applied Mathematics (SIAM)	2018-Current
Association for Women in Mathematics (AWM)	2024-Current

PROFESSIONAL SERVICE

• Referee for Journals

3. Frontiers in Medicine, section Intensive Care Medicine and Anesthesiology
2. Mathematical Methods in the Applied Sciences
1. *Chaos*: An interdisciplinary Journal of Nonlinear Science

CONFERENCES (CO-)ORGANIZER

- 4. Mini-Symposium Lead Organizer** with Zengyan Zhang, Xiaofeng Xu
SIAM Conference on Computational Science and Engineering (CSE27)
Feb. 22nd-26th, 2027
Pittsburgh, Pennsylvania, U.S.
 - MS Topic: Scientific Machine Learning Methods and High-Performance Computing for Complex PDEs and Applications. (2 sessions, 8 talks)
- 3. Mini-Symposium Lead Organizer** with Zengyan Zhang, Yanfang Liu
SIAM Conference on Mathematics of Data Science (MDS26)
Nov. 16th-20th, 2026
Salt Lake City, Utah, U.S.
 - MS Topic: Innovative Neural Network and Data-Driven Methods for PDEs and Applications. (2 sessions, 8 talks)
- 2. Seminar Co-organizer** with McKenzie Black, Thomas Hamori
The Applied and Computational Mathematics (ACM) Student Seminar
2021-2023
University of South Carolina, Columbia, SC, U.S.
- 1. Vice-President**
SIAM student chapter
2020 - 2022
University of South Carolina, Columbia, SC, U.S.
 - Instrumental in organizing talks, workshops, special sessions in liaison with the President.

COMPUTER SKILLS

Main skills	Matlab, Python, Pytorch, $\LaTeX$, Markdown
Languages	English (fluent), Chinese (native)

CONFERENCES AND PRESENTATIONS

1. SIAM Conference on Mathematics of Data Science (MDS26), Salt Lake City, Utah, US (presentation) Nov. 2026
2. SIAM Conference on the Life Sciences (LS26), Cleveland, Ohio, US (presentation) Jul. 2026
3. AI in Biomedical Modeling, 2026 SC EPSCoR State Conference, Columbia, SC, US (presentation) Apr. 2026
4. Talk for undergraduates sponsored by Association for women in mathematics, Department of Mathematics, University of South Carolina, Columbia, SC, US (presentation) Apr. 2026
5. 2025 SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, Texas, US (presentation) Mar. 2025
6. Minisymposium on Data Science, Discrete Math, and Theoretical Computing, the 2024 SIAM New York-New Jersey-Pennsylvania Section Conference (SIAM-NNP 2024), Rochester, NY, US (presentation) Nov. 2024
7. Minisymposium on Model-Free Long-Horizon Time Series Forecasting with Mamba and Bayesian Neural Networks, the 2024 SIAM Conference on Mathematics of Data Science (MDS24), Atlanta, Georgia, US (presentation & poster) Oct. 2024
8. Minisymposium on Computational Mathematics for Engineering and Sciences, State College, PA, US (poster) Nov. 2023
9. Workshop on Mathematical and Computational Biology, ICERM, Brown University, Providence, RI, US (poster) Jun. 2023
10. Minisymposium on Methods, Models, and Analysis of Complex Systems, 2023 SIAM Southeastern Atlantic Section Annual Meeting (SIAM SEAS), Virginia Tech, VA, US (presentation) Mar. 2023
11. Artificial Intelligence for Sensing and Diagnosis Core Breakout Session AI for Medical Research and Treatment, The National Big Data Health Science Conference, Columbia, SC, US (presentation) Feb. 2023

12. The 40th Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE), Raleigh, NC, US (presentation) Nov. 2022
13. The 2022 Made in SC Research Fellows and Faculty Conference and Celebration, Greenville, SC, US (poster) Oct. 2022