Chunyan Li, Ph.D.

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Employment

May 2025 – present	**Postdoctoral Scholar**, Department of Mathematics, University of South Carolina, Columbia, SC 29208. Mentor: Qi Wang.
Jan. 2024 – May 2025	**Postdoctoral Scholar**, Department of Mathematics, The Pennsylvania State University, State College, PA 16801. Mentor: Wenrui Hao.

Education

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

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

Grants and Travel Awards

Nov. 2026	**Association for Women in Mathematics (AWM) Travel Grant**, up to $2,500, for the SIAM Conference on Computational Science and Engineering (CSE27), Pittsburgh, PA, February 22–26, 2027.
Jul. 2026	**SIAM Early Career Travel Award**, $1,000, for the 2026 SIAM Conference on the Life Sciences (LS26).
May 2023 – Aug. 2024	**SPARC Graduate Research Grant**, $5,000. Only 49 recipients among all graduate students are selected by the Office of the Vice President for Research at the University of South Carolina.
Jun. 2023	**Travel Award**, ICERMS at Brown University, Mathematical and Computational Biology. **Travel Award**, ICERMS at Brown University, Mathematical and Scientific Machine Learning.
Nov. 2022	**Travel Award**, $500, the 40th SEARCDE Conference.

Publications

Preprints Submitted

10 **Chunyan Li**, Xuelong Gu and Qi Wang. Data-driven Parameter Estimation for Flows in Unsaturated Soil Using the Extended Kalman Filter.

9 **Chunyan Li**, Parwane P. Pagano, Ning Wei, and Wenrui Hao. Non-invasive Arterial Blood Pressure Estimation from ECG signals using Random Projection Neural Networks.

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.

7 **Chunyan Li**, Qi Wang. Random Projection Neural Networks for Phase-Field Models: Model Reformulation, Scaling, and Network Architecture. arXiv:2611.28859

Refereed Journals

6 **Chunyan Li**, Yutong Mao, Xiao Liu, and Wenrui Hao. Data-driven modeling of spatiotemporal dynamics using multimodal imaging data. *PLOS Computational Biology* 22, no. 9 (2026): e1014751. doi:10.1371/journal.pcbi.1014751

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

Honors and Awards

AY 2022–2023 **SEC Emerging Scholars Fellowship**, Graduate School, University of South Carolina.
Only five recipients among all graduate and postdoctoral students are selected in the university. Provides a $35,000 supplemental 9-month assistantship stipend and an additional $3,000 for professional development (e.g., conference travel, workshops) and/or research support.

Dec. 2023 **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.

Apr. 2022 **C.C. Royal Fellowship**, $2,000, Graduate School, University of South Carolina.
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.

Honors and Awards (continued)

Apr. 2020 & May 2022	**George W. Johnson Graduate Fellowship**, $2,000, Department of Mathematics, University of South Carolina. Given annually by the Department of Mathematics, one recipient each year.
Apr. 2019	**Outstanding First-Year ACM Student**, Department of Mathematics, University of South Carolina. Given annually by the Department of Mathematics, one recipient each year.
Dec. 2017	**Xiangjiang Scholarship for Excellent Students**, Department of Mathematics, Xiangtan University. Given annually for the top student by the Department of Mathematics.
May 2017	**Advanced Individual of Volunteer Activities**, Xiangtan University.
Sep. 2014 – Jun. 2018	**Scholarships for excellent students in honors class** (4-year tuition fellowship), Xiangtan University.
Nov. 2016	**National Encouragement Scholarship**, Xiangtan University. Given annually for the top student by the Department of Mathematics, one recipient each year.
May 2015	**Outstanding Student Cadre**, Xiangtan University. **Second-class scholarship** (Top 2/19), Xiangtan University. **Outstanding teacher of the MUJIN Volunteer organization**, Xiangtan University, China.
2015–2016	**Undergraduate National Mathematical Contest in Modeling**. 05/2015: Xiangtan University Third Prize; 02/2016: Successful Participant (USA); 11/2016: Provincial First Prize; 12/2016: National First Prize.
2016–2017	**National Mathematical Competition of the Math Major Undergraduate Student**. 11/2016: Provincial First Prize; 11/2016: National Second Prize; 12/2017: Provincial Third Prize.

Teaching Experience

Fall 2024	**Instructor**, The Pennsylvania State University. MATH 452: Deep Learning Algorithms and Analysis.
Spring 2024 & 2025	**Instructor**, The Pennsylvania State University. Math/CMPSCE 451: Numerical Computations.
Spring 2020	**Instructor**, University of South Carolina. Math 115: PreCalculus.
Fall 2025	**Recitation Leader**, University of South Carolina. Math 242: Ordinary Differential Equations.
Fall 2021	**Recitation Leader**, University of South Carolina. Math 528: Mathematical Foundation of Data Science and Machine Learning.
Fall 2019	**Recitation Leader**, University of South Carolina. Math 142: Calculus II (2 sections).
Spring 2019 & Fall 2020	**Recitation Leader**, University of South Carolina. Math 141: Calculus I (2 sections).
Fall 2016 & Spring 2017	**Mentor**, Xiangtan University. Fall 2016: Class 2 in the Department of Mathematics. Spring 2017: Honors class in the 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.

Mentoring Experiences

Summer 2025 **Mentor in REU Summer School**, University of South Carolina, Columbia, SC, USA.

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

Summer 2022 **Mentor in REU Summer School**, University of South Carolina, Columbia, SC, USA.

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

Professional Service

Referee for Journals Mathematical Methods in the Applied Sciences.
Chaos: An Interdisciplinary Journal of Nonlinear Science.
Frontiers in Medicine, section Intensive Care Medicine and Anesthesiology.

Conferences (Co-)Organizer

Feb. 22–26, 2027 **Mini-Symposium Lead Organizer**, with Zengyan Zhang and Xiaofeng Xu.
SIAM Conference on Computational Science and Engineering (CSE27), Pittsburgh, PA, USA.
MS Topic: Scientific Machine Learning Methods and High-Performance Computing for Complex PDEs and Applications. (2 sessions, 8 talks)

Nov. 16–20, 2026 **Mini-Symposium Lead Organizer**, with Zengyan Zhang and Yanfang Liu.
SIAM Conference on Mathematics of Data Science (MDS26), Salt Lake City, Utah, USA.
MS Topic: Innovative Neural Network and Data-Driven Methods for PDEs and Applications. (2 sessions, 8 talks)

2021–2023 **Seminar Co-organizer**, with McKenzie Black and Thomas Hamori.
The Applied and Computational Mathematics (ACM) Student Seminar, University of South Carolina, Columbia, SC, USA.

2020–2022 **Vice-President**, SIAM Student Chapter, University of South Carolina, Columbia, SC, USA.
Instrumental in organizing talks, workshops, and special sessions in liaison with the President.

Memberships of Professional Societies

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

Computer Skills

Main skills Matlab, Python, PyTorch, LaTeX, Markdown.
Languages English (fluent), Chinese (native).

Conferences and Presentations

1 Invited talk at the Applied Math Seminar, Department of Mathematics, University of Alabama, Tuscaloosa, AL, USA. *(Dec. 2026)*

2 Invited talk at the Applied Math Seminar, Department of Mathematical Sciences, University of Arkansas, Fayetteville, AR, USA. *(Nov. 2026)*

3 Invited talk at the Applied Math Seminar, Department of Mathematics, George Washington University, Washington, DC, USA. *Online, (Oct. 2026)*

4 Invited talk at the Interdisciplinary Center for Data-driven Modeling in Biology Seminar (ICDMB), Department of Mathematics, University of California, Riverside, CA, USA. *Online, (Oct. 2026)*

5 Invited talk at the Data Science Seminar, Department of Mathematics and Statistics, Binghamton University, State University of New York, Binghamton, NY, USA. *(Sep. 2026)*

6 SIAM Conference on the Life Sciences (LS26), Cleveland, Ohio, USA (presentation). *(Jul. 2026)*

7 AI in Biomedical Modeling, 2026 SC EPSCoR State Conference, Columbia, SC, USA (presentation). *(Apr. 2026)*

8 Talk for undergraduates sponsored by Association for Women in Mathematics, Department of Mathematics, University of South Carolina, Columbia, SC, USA (presentation). *(Apr. 2026)*

9 2025 SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, Texas, USA (presentation). *(Mar. 2025)*

10 Minisymposium on Data Science, Discrete Math, and Theoretical Computing, the 2024 SIAM New York-New Jersey-Pennsylvania Section Conference (SIAM-NNP 2024), Rochester, NY, USA (presentation). *(Nov. 2024)*

11 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, USA (presentation & poster). *(Oct. 2024)*

12 Minisymposium on Computational Mathematics for Engineering and Sciences, State College, PA, USA (poster). *(Nov. 2023)*

13 Workshop on Mathematical and Computational Biology, ICERM, Brown University, Providence, RI, USA (poster). *(Jun. 2023)*

14 Minisymposium on Methods, Models, and Analysis of Complex Systems, 2023 SIAM Southeastern Atlantic Section Annual Meeting (SIAM SEAS), Virginia Tech, VA, USA (presentation). *(Mar. 2023)*

15 Artificial Intelligence for Sensing and Diagnosis Core Breakout Session AI for Medical Research and Treatment, The National Big Data Health Science Conference, Columbia, SC, USA (presentation). *(Feb. 2023)*

16 The 40th Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE), Raleigh, NC, USA (presentation). *(Nov. 2022)*

17 The 2022 Made in SC Research Fellows and Faculty Conference and Celebration, Greenville, SC, USA (poster). *(Oct. 2022)*

References

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