

Tan Tao-Lin

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Work Experience

- 2020/07 – 2021/07 **Data Scientist**, Phison Electronics Corporation
- 2019/07 – 2020/06 **Junior Data Engineer**, Commerce Connector GmbH, Asia Limited
- 2016/02 – 2016/06 **Teaching Assistant of Classical Mechanics**, Department of Electrophysics, National Chiao Tung University

Education

- 2021/07 – present **PhD, Department of Physics, National Tsing Hua University**
Advisor: *Prof. Yi-Ping Huang*
- 2015 – 2018 **M.Sc., Institute of Physics, National Chiao Tung University**
Thesis title: *Tensor Network Study of the (1+1)-dimensional Thirring Model.*
Advisor: *Prof. C.-J. David Lin*
- 2011 – 2015 **B.Sc., Department of Physics, National Chung Hsing University**
Independent study: *Monte Carlo simulation to 2D Ising model with Metropolis sampling.*
Advisor: *Prof. Ming-Chiang Chung*

Skills

- Languages **Strong reading, writing and speaking competencies for English. Currently learning Japanese N3. Learned German A2. Mandarin and Taiwanese are my mother tongue.**
- Programming **C++, JavaScript, \LaTeX , Python, shell script, SQL, ...**
- DevOps **AWS, CI/CD, Docker, unit test, MLFlow**
- Frontend/Backend **React; Databases, Data Lakes, ETL, serverless, spark, Unix/Linux, web crawling**
- Numerical Methods **Tensor Network, Distributed Computing, Anomaly Detection, Clustering, Monte Carlo, XGBoost, Bayesian Optimization, ...**

Publications

Journal Articles

- 1 Bañuls, M., Cichy, K., Kao, Y.-J., Lin, C.-J. D., Lin, Y.-P., & **Tan, T.-L.** (2019). Phase structure of the (1 + 1)-dimensional massive thirring model from matrix product states. *Physical Review D*, 100.
[doi:10.1103/PhysRevD.100.094504](https://doi.org/10.1103/PhysRevD.100.094504)

Conference Proceedings

- 1 Banuls, M., Cichy, K., Hung, H.-T., Kao, Y.-J., Lin, C.-J. D., Lin, Y.-P., & **Tan, T.-L.** (2020). Phase structure and real-time dynamics of the massive thirring model in 1+1 dimensions using the tensor-network method. (p. 022). [doi:10.22323/1.363.0022](https://doi.org/10.22323/1.363.0022)

- 2 Banuls, M.-C., Cichy, K., Kao, Y.-J., Lin, C.-J. D., Lin, Y.-P., & **Tan, T.-L.** (2019). Investigation of the $1+1$ dimensional thirring model using the method of matrix product states. (p. 229).
[doi:10.22323/1.334.0229](https://doi.org/10.22323/1.334.0229)
- 3 Bañuls, M.-C., Cichy, K., Kao, Y.-J., Lin, C.-J. D., Lin, Y.-P., & **Tan, T.-L.** (2017). Tensor network study of the $(1+1)$ -dimensional thirring model. (Vol. 175). [doi:10.1051/epjconf/201817511017](https://doi.org/10.1051/epjconf/201817511017)

Projects

- 📌 **tnpy**: A python implementation of Matrix Product State algorithms.
- 📌 **mbl**: Many-body localization.
- 📌 **HOTRG-2D-Ising**: Higher-order Tensor Renormalization Group study to 2D classical Ising model (Jupyter notebook).
- 📌 **anko**: A python implementation of anomaly detection algorithms on time series.
- 📌 **EAN-suggestion**: Calculate the Levenshtein distance between the name of web-crawled product and databases for suggesting EAN of product.
- 📌 **binpr**: Pattern recognition on the failed bins in silicon wafer based on OPTICS algorithm.

Miscellaneous Experience

Awards and Achievements

Fall 2021 - Spring 2022 📌 **President's Scholarship**, National Tsing Hua University.

Presentations

- Jan 26 2018 📌 **2018 Annual Meeting of the Physical Society of Taiwan, NTU.**
Title: *Tensor Network Study of the $(1+1)$ -dimensional Thirring Model.*
- June 23 2017 📌 **35th International Symposium On Lattice Field Theory, Granada.**
Title: *Tensor Network study of the $(1+1)$ -dimensional Thirring Model.*
- May 17 2017 📌 **The 12th particle physics phenomenology (ppp12) workshop, NCTU.**
Title: *Tensor Network study of the $(1+1)$ -dimensional Thirring Model.*

Research Visiting

- July 2017 📌 **DAMTP, Cambridge University.**
Invited by: *Prof. Matthew Wingate*
- Apr 2016 📌 **Department of Physics, Goethe University Frankfurt.**
Invited by: *Dr. Krzysztof Cichy*

Business Trip

- Dec 2019 📌 **Annual meeting at Commerce Connector GmbH headquarters, Stuttgart.**

Miscellaneous Experience (continued)

Conferences and Workshops

- Aug 2022 ■ 2022 summer school for physics and tensor-network methods in correlated systems
- 2022 NCTS summer school on frontier topics in strongly correlated electron systems
- Feb 2022 ■ NCTS Winter Course 2022: Parallel Finite Element Method using Super-computer
- Sep 2021 ■ Stat&QuantPhys Autumn School 2021 (SQP2021)
- July 2021 ■ The NCTS international summer school and workshop on emergent quantum many-body phenomena
- The 2021 Boulder School for Condensed Matter and Materials Physics
- Apr 2021 ■ NVIDIA GPU Technology Conference 2021
- Mar 2021 ■ Workshop on Non-equilibrium Systems and Machine Learning
- Feb 2021 ■ AWS AI/ML Web Day Taiwan
- Dec 2020 ■ AWS re:Invent
- AWS Dev Day Taipei
- Sep 2020 ■ AWS machine learning invention workshop
- May 2018 ■ Mini-workshop on composite Higgs models and lattice gauge theory
- Mar 2018 ■ NVIDIA Deep Learning Workshop
- Jan 2018 ■ 2018 Annual Meeting of the Physical Society of Taiwan
- Dec 2017 ■ NCTS Annual Theory Meeting 2017: Particles, Cosmology and Strings
- July 2017 ■ Workshop on hadron physics and QCD
- June 2017 ■ 35th International Symposium On Lattice Field Theory
- May 2017 ■ The 12th particle physics phenomenology (ppp12) workshop
- Apr 2017 ■ Third TEQMS Hackathon
- Dec 2016 ■ NCTS Annual Theory Meeting 2016: Quantum Simulations and Numerical Studies in Many-Body Physics
- The fourth workshop on Tensor Network States: Algorithms and Applications
- Dec 2015 ■ Workshop on non-perturbative QFT and LHC physics
- Sep 2015 ■ Second Hackathon for NCTS Thematic Group on Topology and Entanglement in Quantum Many-body Systems
- Aug 2014 ■ AMO Summer School

Journal Clubs

- Spring 2018 ■ Conjugate Gradient Descent, NCTU
- Fall 2016 ■ Lattice Quantum Chromodynamics, NTHU
- Fall 2015 ■ Tensor Network Methods, NCTU
- Spring 2014 ■ Topological Insulators and Topological Superconductors, NCHU

Miscellaneous Experience (continued)

Poster

Dec 12 2016

📖 **The fourth workshop on Tensor Network States: Algorithms and Applications, NTHU.**

Title: *Tensor network study to (1+1)-dimensional field theory: The quantum soliton states in sine-Gordon theory*