

# Curriculum Vitae

**Name:** Jia YIN

**Home Address:** 122 Roble Road, Apt 205, Walnut Creek, CA94597

**Mobile Phone:** + 1 9252852235

**E-mail:** jiayin@lbl.gov

**Google Scholar:** Jia Yin

## Position:

Jun, 2020 - present	Postdoctoral Fellow Computational Research Division Lawrence Berkeley National Laboratory
Sep, 2019 - Jun, 2020	Research Fellow Department of Mathematics National University of Singapore

## Education:

Aug, 2015 - Nov, 2019	National University of Singapore Ph.D., NUS Graduate School for Integrative Science and Engineering <b>Supervisor:</b> Prof. Weizhu Bao <b>Thesis title:</b> Multiscale Methods and Analysis for the Dirac/Nonlinear Dirac Equation
Aug, 2011 - Jul, 2015	Tsinghua University, Beijing Bachelor, majoring in Mathematics

## Visiting Experience:

Jun, 2019	Visiting Scholar Beijing Computational Science Research Center (CSRC)
May, 2017 - Jun, 2017	Visiting Scholar Beijing Computational Science Research Center (CSRC)

## Awards:

- 1st prize of EASIAM Student Paper Award, 2020-2021
- Certificate of Recognition for SIAM Student Chapter@NUS, 2019
- NGS Scholarship at NUS in Integrative Sciences and Engineering, 2015 - 2019
- Selected to be a member of 'Math School Class' for top-achieving students, Tsinghua University, 2013 - 2015
- Integrated Scholarship for All-round Achievement, the Department of Mathematics, Tsinghua University, 2013
- 1st Prize for Social Practice (leader of the team), the Department of Mathematics, Tsinghua University, 2012
- Scholarship for new students, 2nd Prize across all of Tsinghua University, 2011

## Publications:

### Submitted/In preparation:

21. GPU acceleration of non-equilibrium Green's function calculation using OpenACC and CUDA FORTRAN (with K. Ibrahim, M. D. Ben, J. Deslippe, Y. Chan and C. Yang), in preparation.

20. Dynamic mode decomposition of nonequilibrium electron-phonon dynamics: accelerating the first-principles real-time Boltzmann equation (with I. Maliyov, J. Yao, C. Yang, and M. Bernardi), *arXiv:2311.07520*.
19. A hybrid method for quantum dynamics simulation (with N. Gomes, S. Niu, C. Yang, and W. A. de Jong), *arXiv:2307.15231*.
18. Manipulating chiral-spin transport with ferroelectric polarization (with X. Huang, X. Chen, Y. Li, etc.), *arXiv:2306.02185*.

**Published/Accepted:**

17. Learning nonlinear integral operators via recurrent neural networks and its application in solving integro-differential equations (with H. Bessi, Y. Zhu, S. Ling, C. Reeves, V. Vlcek and C. Yang), *Machine Learning with Applications* 15 (2024), 100524. (citation 1, impact factor 6.0)
16. Stochastic real-time second-order Green's function theory for neutral excitations in molecules and nanostructures (with L. Mejía, C. Yang, D. R. Reichman, E. Rabani, W. Dou, J. Lee, J. Zhu, and R. Baer), *Journal of Chemical Theory and Computation* 19 (2023), 5563–5571. (citation 2, impact factor 6.6)
15. Dynamic mode decomposition for extrapolating non-equilibrium Green's functions dynamics (with C. Reeves, Y. Zhu, K. Ibrahim, V. Vlcek, and C. Yang), *Physical Review B* 107 (2023), 075107. (citation 5, impact factor 3.7)
14. Analyzing and predicting non-equilibrium many-body dynamics via dynamic mode decomposition (with Y. Chan, F. Jornada, D. Qiu, C. Yang, and S. G. Louie), *Journal of Computational Physics* 477 (2023), 111909. (citation 8, impact factor 4.1)
13. Improved uniform error bounds of time-splitting methods for the long-time dynamics of the Dirac equation with small potentials (with W. Bao and Y. Feng), *Multiscale Modeling & Simulation* 20 (2022), 1040–1062. (citation 14, impact factor 1.9)
12. Using dynamic mode decomposition to predict the dynamics of a two-time non-equilibrium Green's function (with Y. Chan, F. Jornada, D. Qiu, S. G. Louie, and C. Yang), *Journal of Computational Science* 64 (2022), 101843. (citation 5, impact factor 3.8)
11. Control of spin current and antiferromagnetic moments via topological surface state (with X. Chen, H. Bai, Y. Ji, etc.), *Nature Electronics* 5 (2022), 574–578. (citation 18, impact factor 33.3)
10. Spatial resolution of different discretizations over long-time for the Dirac equation with small potentials (with Y. Feng), *Journal of Computational and Applied Mathematics*, 412 (2022), 114342. (citation 11, impact factor 2.4)
9. Uniform error bounds of exponential wave integrator methods for the long-time dynamics of the Dirac equation with small potentials (with Y. Feng and Z. Xu), *Applied Numerical Mathematics*, 172 (2022), 50–66. (citation 11, impact factor 2.8)
8. Error estimates of finite difference time domain methods for the Dirac equation in the nonrelativistic and massless regime (with Y. Ma), *Numerical Algorithms*, 89 (2022), 1515–1440. (citation 3, impact factor 2.1)
7. Uniform error bounds of time-splitting methods for the nonlinear Dirac equation in the nonrelativistic limit regime (with W. Bao, and Y. Cai), *SIAM Journal on Numerical Analysis*, 59 (2021), 1040–1066. (citation 14, impact factor 3.2)
6. A fourth-order compact time-splitting method for the Dirac equation with time-dependent potentials, *Journal of Computational Physics*, 430 (2021), 110109. (citation 6, impact factor 4.1)
5. Simple high-order boundary conditions for computing rogue waves in the nonlinear Schrödinger equation (with P. Wang and Z. Xu), *Computer Physics Communications*, 251 (2020), 107109. (citation 3, impact factor 4.7)
4. Super-resolution of time-splitting methods for the Dirac equation in the nonrelativistic limit regime (with W. Bao and Y. Cai), *Mathematics of Computation*, 89 (2020), 2141–2173. (citation 21, impact factor 2.4)
3. Error bounds of the finite difference time domain methods for the Dirac equation in the semiclassical regime (with Y. Ma), *Journal of Scientific Computing*, 81 (2019), 1801–1822. (citation 10, impact factor 2.5)
2. A fourth-order compact time-splitting Fourier pseudospectral method for the Dirac equation (with W. Bao), *Research in the Mathematical Sciences*, Vol. 6 (2019), article 11. (citation 21, impact factor 1.2)
1. Error estimates of numerical methods for the nonlinear Dirac equation in the nonrelativistic limit regime (with W. Bao, Y. Cai and X. Jia), *Science China Mathematics*, 59 (2016), 1461–1494. (citation 63, impact factor 1.4)

## Conferences:

## Upcoming:

- **Speaker**, International Conference on Scientific Computation and Differential Equations (SciCADE 2024), National University of Singapore, Singapore.
- **Speaker**, SIAM Conference on Mathematical Aspects of Materials Science (MS24), May 19, 2024 – May 23, 2024, Sheraton Pittsburgh Hotel at Station Square, Pittsburgh, Pennsylvania, U.S.

## Invited:

- **Speaker**, 4th Berkeley Excited States Conference (BESC2023), February 16, 2023 – February 17, 2023, Oakland, California, U.S.
- **Speaker**, Berkeley Lab CS Area Postdoc Symposium, February 7, 2023, Berkeley, California, U.S.
- **Speaker**, SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP22), February 23, 2022 – February 26, 2022, Virtual conference, Seattle, Washington, U.S.
- **Poster presenter**, SIAM Conference on Computational Science and Engineering (SIAM CSE21), March 1, 2021 – Mar 5, 2021, Virtual conference, Fort Worth, Texas, U.S.
- **Speaker**, Quantum and Kinetic Problems: Modeling, Analysis, Numerics and Applications, Sep 30, 2019 – Mar 31, 2020, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- **Speaker**, International Conference on Scientific Computation and Differential Equations (SciCADE 2019), July 22 – 26, 2019, University of Innsbruck, Austria.
- **Speaker**, International Congress on Industrial and Applied Mathematics (ICIAM 2019), July 15 – 19, 2019, Valencia, Spain.
- **Speaker**, Workshop on “Mathematical Analysis and Computation for Quantum Systems”, January 4 – 6, 2019, Beijing International Center for Mathematical Research and School of Mathematical Sciences, Peking University, Beijing, China.

## Participated:

- Workshop on Scientific Computing Across Scales: Quantum Systems in Cold-matter Physics and Chemistry, April 22 – 26, 2019, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada.
- One-month program on “Modeling and Simulation of Interface Dynamics in Fluids/Solids and Their Applications”, April 23 – May 18, 2018, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Workshop on Mathematical Model and Computation of Nonlinear Problems, January 15-19, 2018, Tsinghua Sanya International Mathematics Forum (TSIMF), Sanya, Hainan Island, China.
- HKUST IAS Focused Program on Scientific Computing, December 4 – 8, 2017, Jockey Club Institute for Advanced Study, Hong Kong University of Science and Technology, Hong Kong, China.
- Summer Graduate School: Electronic Structure Theory, July 18 – 29, 2016, the Lawrence Berkeley National Laboratory, Berkeley, San Francisco, the United States of America.
- Computational and Mathematical Methods for Materials Defects and Multiphase Flows, February 23 – March 12, 2015, Institute for Mathematical Sciences, National University of Singapore, Singapore.

## Teaching Experience:

## Others:

**Teaching Assistant, Department of Mathematics, NUS**

Singapore

MA1301 Introductory Mathematics

Aug 2017 – Dec 2017

MA5205 Graduate Analysis I

Aug 2016 – Dec 2016

MA1506 Mathematics II

Jan 2016 – May 2016

MA1505 Mathematics I

Aug 2015 – Dec 2015

**Teaching Assistant, Department of Mathematics, Tsinghua University**

Beijing, China

Multivariable Calculus

Mar 2015 – Jul 2015

- Served as the president of SIAM Student Chapter@NUS, August 2018 - July 2019
- Co-supervised with Prof. Weizhu Bao the final year project of Jeremy Yeo, an undergraduate student at NUS, October 2019 - March 2020
- Programming: MATLAB, Python, C, C++, MPI, OpenMP, OpenACC
- Language: Chinese, English (proficient), Japanese (intermediate), Spanish (beginner)
- Interests: Chinese calligraphy, table tennis, drawing