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广东工业大学数学与统计学院 · 副教授

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个人信息

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工作经历

副教授，广东工业大学数学与统计学院，2021.09–至今

博士后，合作者: 蔡振宁教授，新加坡国立大学数学系，2019.08–2021.08

教育背景

理学博士，导师: 胡光辉教授，计算数学，澳门大学，2016.08 – 2019.07

理学硕士，导师: 胡光辉教授，计算数学，澳门大学，2013.09 – 2016.06

理学学士，信息与计算科学，武汉大学，2009.09 – 2013.06

研究方向

主要研究电子结构及相关量子模型的高效数值方法，包括多空间近似、自适应有限元与特征值算法；同时研究复 Langevin 方法的适用性与正则化。

学术论文

1. Pengfei Hao, Renfeng Peng, Yang Kuang, and Bin Gao, "High-dimensional extreme eigenvalue problems: low-rank tensor parametrization and optimization", arXiv:2609.30138, 2026. (链接)
2. Mingzhe Li, Yang Kuang*, and Zhicheng Hu, "A multi-mesh adaptive finite element method for solving the Gross-Pitaevskii equation", Advances in Applied Mathematics and Mechanics, 2026+. (链接)
3. Yang Kuang and Guanghui Hu, "A novel splitting strategy to accelerate solving generalized eigenvalue problem from Kohn–Sham density functional theory", Computer Physics Communications, 322, 110056, 2026. (链接)
4. Tao Wang, Yang Kuang*, Ran Zhang, and Guanghui Hu, "A hierarchical splines-based h-adaptive isogeometric solver for all-electron Kohn–Sham equation", Journal of Computational Physics, 534, 114003, 2025. (链接)
5. Zheming Luo and Yang Kuang*, "A high-order accurate moving mesh finite element method for the radial Kohn–Sham equation", Molecular Physics, 2025. (链接)
6. Yang Kuang, Yedan Shen, and Guanghui Hu. "Towards chemical accuracy using a multi-mesh adaptive finite element method in all-electron density functional theory", Journal of Computational Physics, 518, 113312, 2024. (链接)
7. Zhenning Cai, Jingwei Hu, Yang Kuang, and Bo Lin, "An entropic method for discrete systems with Gibbs entropy", SIAM Journal on Numerical Analysis, 60(4), 2345–2371, 2022. (链接)
8. Bin Gao, Guanghui Hu, Yang Kuang*, and Xin Liu, "An orthogonalization-free parallelizable framework for all-electron calculations in density functional theory", SIAM Journal on Scientific Computing, 44(3), B723–B745, 2022. (链接)
9. Zhenning Cai, Yang Kuang*, and Hong Kiat Tan, "Regularization of Complex Langevin Method", Physical Review D, 105, 014508, 2022. (链接)
10. Zhenning Cai, Xiaoyu Dong, and Yang Kuang, "On the validity of complex Langevin method for path integral computations", SIAM Journal on Scientific Computing, 43(1), A685–A719, 2021. (链接)

11. 况阳, 申烨丹, 胡光辉, “科恩-沈方程与含时科恩-沈方程的一个自适应有限元数值方法”, 《数值计算与计算机应用》, 42(1), 33–55, 2021. (链接)
12. Yang Kuang, and Guanghui Hu, “On stabilizing and accelerating SCF using ITP in solving Kohn–Sham equation”, Communications in Computational Physics, 28(3), 999–1018, 2020. (链接)
13. Yedan Shen, Yang Kuang, and Guanghui Hu, “An asymptotic-based adaptive finite element method for Kohn–Sham equation”, Journal of Scientific Computing, 79(1), 464–492, 2019. (链接)
14. Yang Kuang and Guanghui Hu, “An adaptive FEM with ITP approach for Steady Schrödinger equation”, International Journal of Computer Mathematics, 95(1), 187–201, 2018. (链接)

主持项目

- 国家自然科学基金面上项目（NSFC-12671469），2027.01-2030.12
- 国家自然科学基金数学天元基金项目（NSFC-12326362），2024.01-2024.12，合作老师：汤涛院士（BNBU 高等研究院）
- 国家自然科学基金青年科学基金项目（NSFC-12201130），2023.01-2025.12
- 广东省自然科学基金面上项目（2026A1515011703），2026.01-2028.12
- 广东省科协青年科技人才培育计划，2025.01-2026.12
- 飞行器数学建模与高性能计算工信部重点实验室开放课题，2024.01-2025.12
- 广州市基础研究计划基础与应用基础研究项目（2023A04J1321），2023.04-2025.03

访问经历

- 2024.03.01 – 2024.12.31，汤涛院士，BNBU 高等研究院
- 2023.07.07 – 2023.08.13，高斌副研究员，中国科学院数学与系统科学研究院
- 2019.03.20 – 2019.04.10，蔡振宁副教授，新加坡国立大学数学系

学术报告

1. Some numerical methods for all-electron density functional theory，材料模拟中的数学理论、方法与应用研讨会，天元数学国际交流中心，昆明，2025-05-18 至 05-24.
2. Multi-mesh adaptive finite elements for the Kohn−Sham equation, 流体力学相关问题的数值方法与应用研讨会，南京航空航天大学，南京，2023.12.24.
3. Multi-mesh adaptive finite element methods for eigenvalue problems, October 14, 2023, CSIAM 2023, Kunming, China.
4. A multi-mesh adaptive finite element method for Kohn − Sham equation, August 22, 2023, ICIAM 2023 TOKYO, Tokyo, Japan
5. A multi-mesh adaptive finite element method for Kohn–Sham equation, November 19, 2022, TM21, CSIAM 2022
6. An Orthogonalization-free Parallelizable Framework for All-electron Calculations, April 1, 2021, Seminar @ BNU-UIC Research center for mathematics
7. Numerical investigations of Complex Langevin dynamics, June 17, 2020, 9th Symposium on Applied and Computational Mathematics, SIAM Student Chapter @NUS
8. An orthonormalization-free parallelizable algorithm for electronic structure calculation, November 10, 2019, Fudan University, The Workshop on Electronic Structure Calculations.
9. An efficient and adaptive finite element method for Kohn−Sham equation, July 28, 2018, University of Macau, 2018 Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area.
10. An efficient and adaptive finite element method for Kohn–Sham equation, June 24, 2018, University of Tokyo, 13th SIAM East Asian Section Conference 2018.

教学经历

School of Mathematics and Statistics, Guangdong University of Technology 2021.09 –

- 春季课程：数值分析、数学建模、算法设计与分析
- 秋季课程：小波分析、线性代数

Department of Mathematics, University of Macau 2013.09 – 2019.07

- *MATB 221 - Mathematical Analysis II (Tutorial section) (2018 Spring, 2017 Spring, 2014 Spring)*
- *MATB 212 - Mathematical Analysis I (Tutorial section) (2017 Fall, 2016 Fall, 2013 Fall)*
- *EDUC 491 - Seminar (Tutorial section) (2013 Fall)*

计算工具与科研软件

- 编程语言：C/C++, Python, Matlab, Mathematica, LaTeX
- 高性能计算：Linux, Shell
- 并行计算：OpenMP, OpenMPI