

Yang KUANG

CONTACT INFORMATION	Address : School of Mathematics and Statistics, Guangdong University of Technology, No. 161 Yinglong Road, Guangzhou, 510520, China Phone : +86 173 7247 3226 Email : ykuang@gdut.edu.cn, kuangyoung0107@gmail.com
EDUCATION	PhD, Computational Mathematics , University of Macau, <i>2016.08 – 2019.07</i> <i>Advisor: Prof. Guanghui Hu</i> MSc, Computational Mathematics , University of Macau, <i>2013.09 – 2016.08</i> <i>Advisor: Prof. Guanghui Hu</i> BSc, Information and Computational Science , Wuhan University, <i>2009.09 – 2013.06</i>
WORK EXPERIENCE	Associate Professor School of mathematics and statistics, Guangdong University of Technology <i>2021.09 – present</i> Research Fellow Department of mathematics, National University of Singapore <i>Mentor: Prof. Zhenning Cai 2019.08 – 2021.08</i>
RESEARCH INTERESTS	<ul style="list-style-type: none">• Efficient and adaptive numerical methods for density functional theory• Complex Langevin method in quantum chromodynamics
SUBMITTED	<ol style="list-style-type: none">1. Yang Kuang, Yedan Shen, and Guanghui Hu, “Towards chemical accuracy using a multi-mesh adaptive finite element method in all-electron density functional theory”, available at arXiv:2310.15651, 2023. (link)
REFEREED JOURNAL ARTICLES	<ol style="list-style-type: none">1. Zhenning Cai, Jingwei Hu, Yang Kuang, and Bo Lin, <i>An entropic method for discrete systems with Gibbs entropy</i>, SIAM Journal on Numerical Analysis, 60(4), 2345-2371, 2022. (link)2. Bin Gao, Guanghui Hu, Yang Kuang*, and Xin Liu, <i>An orthogonalization-free parallelizable framework for all-electron calculations in density functional theory</i>, SIAM Journal on Scientific Computing, 44(3), B723-B745, 2022. (link)3. Zhenning Cai, Yang Kuang*, and Hong Kiat Tan, <i>Regularization of Complex Langevin Method</i>, Physical Review D, 105, 014508, 2022. (link)4. Yang Kuang, Yedan Shen and Guanghui Hu, <i>An h-adaptive finite element method for Kohn–Sham and time-dependent Kohn–Sham equations</i>, Journal on Numerical Methods and Computer Applications (in Chinese), 42(1), 33–55, 2021. (link)5. Zhenning Cai, Xiaoyu Dong and Yang Kuang, <i>On the validity of complex Langevin method for path integral computations</i>, SIAM Journal on Scientific Computing, 43(1), A685–A719, 2021. (link)6. Yang Kuang, and Guanghui Hu. <i>On stabilizing and accelerating SCF using ITP in solving Kohn-Sham equation</i>, Communications in Computational Physics, 28(3), 999–1018, 2020. (link)7. Yedan Shen, Yang Kuang, and Guanghui Hu. <i>An asymptotic-based adaptive finite element method for Kohn–Sham equation</i>, Journal of Scientific Computing, 79(1), 464–492, 2019. (link)8. Yang Kuang and Guanghui Hu. <i>An adaptive FEM with ITP approach for Steady Schrödinger equation</i>, International Journal of Computer Mathematics, 95(1), 187–201, 2018. (link)

IN PREPARATION

1. Joint work with Bin Gao, Guanghui Hu, and Xin Liu. *An orthogonalization-free parallelizable algorithm for all-electron calculations in density functional theory: with h -adaptivity.*
2. **Yang Kuang** and Guanghui Hu, *A multi-mesh adaptive finite element method for eigenvalue problem.*
3. **Yang Kuang** and Guanghui Hu, *An h -adaptive finite element framework for density functional theory potential energy surface calculations.*

SKILLS

- Programming Languages: C/C++, Python, Matlab, Mathematica, L^AT_EX
- High performance computing: Linux, Shell
- Parallel computing: OpenMP, OpenMPI

TALKS

1. Multi-mesh adaptive finite element methods for eigenvalue problems, Oct 14, 2023, Kunming, CSIAM 2023.
2. A multi-mesh adaptive finite element method for KohnSham equation, Aug 22, 2023, Tokyo, Japan, ICIAM 2023 TOKYO.
3. A multi-mesh adaptive finite element method for KohnSham equation, CSIAM 2022, Online.
4. An Orthogonalization-free Parallelizable Framework for All-electron Calculations, April 1, 2021, Seminar @ BNU-UIC Research center for mathematics
5. Numerical investigations of Complex Langevin dynamics, June 17, 2020, 9th Symposium on Applied and Computational Mathematics, SIAM Student Chapter @NUS
6. An orthonormalization-free parallelizable algorithm for electronic structure calculation, November 10, 2019, Fudan University, The Workshop on Electronic Structure Calculations.
7. 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.
8. An efficient and adaptive finite element method for Kohn-Sham equation, June 24, 2018, University of Tokyo, 13th SIAM East Asian Section Conference 2018.

VISITING EXPERIENCE

- 2023.07.07 – 2023.08.13, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China. Host: Prof. Bin Gao.
- 2021.02.18 – 2021.04.18, BNU-UIC Research center for mathematics, Zhuhai, China. Host: Prof. Tao Tang.
- 2019.03.20 – 2019.04.10, Department of Mathematics, National University of Singapore, Singapore. Host: Prof. Zhenning Cai.
- 2015.08.10 – 2015.08.14, Institute of Computational Mathematics, Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences, China.
- 2014.07.20 – 2014.08.01, School of Mathematical Sciences, Peking University, China.

CONFERENCES
AND WORKSHOPS
ATTENDED

- 21st Annual meeting of China Society for Industry and Applied mathematics, Oct 12-15, 2023, Kunming, Yunnan, China.
- 10th International Congress on Industrial and Applied Mathematics, Aug 20-25, 2023, Tokyo, Japan.
- 20th Annual meeting of China Society for Industry and Applied mathematics, 2022, online.
- SIAM Student Chapter @NUS, 9th Symposium on Applied and Computational Mathematics, Jun 17, 2020.
- Workshop on Electronic Structure Calculations, Nov 9 – Nov 10, 2019, Fudan University, Shanghai, China.
- 2018 Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area, Jul 26 – Jul 29, 2018, University of Macau, Macau SAR.
- Summer school, Mathematics and Computations in Material Science, Jun 25 – Jul 6, 2018, Soochow University, Suzhou, China.
- 13th SIAM East Asian Section Conference 2018, Jun 22 – 25, 2018, University of Tokyo, Tokyo, Japan.
- Summer school and workshop, Focus Activity on Mathematical and Computational methods for Quantum and Kinetic Problems, Jun 7 – 14, 2017, Beijing Computational Science Research Center (CSRC), Beijing, China.
- Workshop on AFEPack, Jul 12 – 16, 2016, University of Macau, Macau SAR.
- SIAM: East Asian Section Conference 2016, Jun 20 – 22, 2016, University of Macau, Macau SAR.
- Summer school, Numerical methods for Partial Differential Equations, Aug 15 – 21, 2015, Peking University, Beijing, China.
- Workshop on AFEPack, Jun 25 – Jul 2, 2015, University of Macau, Macau SAR.
- The 5th International Conference on Scientific Computing and Partial Differential Equations, Dec 8 – 12, 2014, Hong Kong Baptist University, Hong Kong.

TEACHING
EXPERIENCE

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

- *Advanced English for Mathematics* (2023 Fall)
- *Numerical Analysis* (2023 Spring)
- *Mathematical Modeling* (2023 Spring)
- *Wavelet Analysis* (2022 Fall)
- *Linear Algebra* (2022 Spring)

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)