Assistant Professor YANG, JUNXIANG

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Academic Qualification

Ph.D. in Applied Mathematics, Korea University, Seoul, Republic of Korea, 2021

M.S. in Applied Mathematics, Korea University, Seoul, Republic of Korea, 2019

B.Eng in Naval Architecture and Ocean Engineering, Chongqing Jiaotong University, Chongqing, China, 2017

Teaching Area

PHYS100 Physics
MATH104 Probability and Statistics
CS480-01 Topics in Computer Science
CS190/EIE190/SE190 Professional Ethics and Communication Skills

Research Area

- Computational Fluid Dynamics
- Numerical Simulation of Multi-phase Flows
- Numerical Algorithms for PDEs
- Phase-field Method and Applications
- Mathematical Modeling in Science and Engineering

Working Experience

- 2023.09-present, Assistant Professor, Faculty of Innovation Engineering, Macau University of Science and Technology, Macao SAR, China
- 2021.12-2023.06, Post-doctoral Researcher, Sun Yat-sen University, Guangzhou, China

Personal Academic Website

https://cfdyang521.github.io

Academic Publication (Selected)

For more details, please refer to my personal website or

1. **Junxiang Yang**, Junseok Kim*, A phase-field model and its efficient numerical method for two-phase flows on arbitrarily curved surfaces in 3D space, ***Computer Methods in Applied Mechanics and Engineering*** , Vol. 372, 113382, 2020. (Q1)
2. **Junxiang Yang**, Yibao Li, Junseok Kim*, Totally decoupled implicit-explicit linear scheme with corrected energy dissipation law for the phase-field fluid vesicle model, ***Computer Methods in Applied Mechanics and Engineering*** , Vol. 399, 115330, 2022. (Q1)
3. **Junxiang Yang***, Phase field modeling and computation of multi-component droplet evaporation, ***Computer Methods in Applied Mechanics and Engineering*** , Vol. 401, 115675,
4. **Junxiang Yang**, Jingwen Wu, Zhijun Tan*, Phase-field modeling and consistent energy-stable simulation of binary creeping flows in contact with solid, ***Computer Methods in Applied Mechanics and Engineering*** , Vol.414, 116180, 2023. (Q1)
5. **Junxiang Yang**, Junseok Kim*, Phase-field simulation of multiple fluid vesicles with a consistently energy-stable implicit-explicit method, ***Computer Methods in Applied Mechanics and Engineering*** , Vol.417, 116403, 2023. (Q1)

6. **Junxiang Yang**, Yibao Li, Junseok Kim*, A practical finite difference scheme for the Navier-Stokes equation on curved surfaces in R3, ***Journal of Computational Physics*** , Vol. 411,
7. **Junxiang Yang**, Zhijun Tan, Junseok Kim*, Linear and fully decoupled scheme for a hydrodynamics coupled phase-field surfactant system based on a multiple auxiliary variables approach, ***Journal of Computational Physics*** , Vol. 452, 110909, 2022. (Q1)
8. Zhijun Tan, Jingwen Wu, **Junxiang Yang***, Efficient and practical phase-field method for the incompressible multi-component fluids on 3D surfaces with arbitrary shapes, ***Journal of Computational Physics*** , Vol. 467, 111444, 2022. (Q1)
9. **Junxiang Yang**, Junseok Kim*, Numerical approximation of the square phase-field crystal dynamics on the three-dimensional objects, ***Journal of Computational Physics*** , Vol. 471,
10. **Junxiang Yang**, Zhijun Tan, Jian Wang, Junseok Kim*, Modified diffuse interface fluid model and its consistent energy-stable computation in arbitrary domains, ***Journal of Computational Physics*** , Vol. 488，112216， 2023. (Q1)
11. **Junxiang Yang**, Yibao Li, Junseok Kim*, Modified multi-phase diffuse-interface model for compound droplets in contact with solid, ***Journal of Computational Physics*** , Vol. 491, 112345,
12. **Junxiang Yang**, Junseok Kim*, Computer simulation of the nonhomogeneous zebra pattern formation using a mathematical model with space-dependent parameters, ***Chaos, Solitons & Fractals*** , Vol. 169, 113249, 2023. (Q1)
13. **Junxiang Yang**, Jian Wang, Junseok Kim*, Energy-stable method for the Cahn-Hilliard equation in arbitrary domains, ***International Journal of Mechanical Sciences*** , Vol. 228, 107489,
14. **Junxiang Yang**, Yibao Li, Chaeyoung Lee, Hyun Geun Lee, Soobin Kwak, Youngjin Hwang, Xuan Xin, Junseok Kim*, An explicit conservative Saul'yev scheme for the Cahn-Hilliard equation, ***International Journal of Mechanical Sciences*** , Vol. 217, 106985, 2022. (Q1)
15. **Junxiang Yang**, Junseok Kim*, Consistent energy-stable method for the hydrodynamics coupled PFC model, ***International Journal of Mechanical Sciences*** , Vol. 241, 107952, 2023.
16. **Junxiang Yang**, Zhijun Tan*, Simple and practical method for the simulations of two-component PFC models for binary colloidal crystals on curved surfaces, ***International Journal of Mechanical Sciences*** , Vol. 225, 107342, 2022. (Q1)
17. **Junxiang Yang**, Junseok Kim*, A variant of stabilized-scalar auxiliary variable (S-SAV) approach for a modified phase-field surfactant model, ***Computer Physics Communications*** , Vol.
18. **Junxiang Yang**, Jian Wang, Zhijun Tan, Junseok Kim*, Efficient IMEX and consistently energy-stable methods of diffuse-interface models for incompressible three-component flows, ***Computer Physics Communications*** , Vol. 282, 108558, 2023. (Q1)
19. Zhijun Tan, Le Chen, **Junxiang Yang***, Generalized Allen-Cahn-type phase-field crystal model with FCC ordering structure and its conservative high-order accurate algorithm, ***Computer Physics Communications*** , Vol. 286, 108656, 2023. (Q1)
20. **Junxiang Yang**, Junseok Kim*, An improved scalar auxiliary variable (SAV) approach for the phase-field surfactant model, ***Applied Mathematical Modelling*** , Vol. 90, 11-29, 2021. (Q1)
21. **Junxiang Yang**, Junseok Kim*, An unconditionally stable second-order accurate method for systems of Cahn-Hilliard equations, ***Communications in Nonlinear Science and Numerical Simulation*** , Vol. 87, 105276, 2020. (Q1)
22. **Junxiang Yang**, Junseok Kim*, Numerical study of the ternary Cahn-Hilliard fluids by using an efficient modified scalar auxiliary variable approach, ***Communications in Nonlinear Science and Numerical Simulation*** , Vol. 102, 105923, 2021. (Q1)
23. Yibao Li, **Junxiang Yang***, Consistency-enhanced SAV BDF2 time-marching method with relaxation for the incompressible Cahn-Hilliard-Navier-Stokes binary fluid model, ***Communications in Nonlinear Science and Numerical Simulation*** , Vol. 118, 107055, 2023.
24. **Junxiang Yang**, Junseok Kim*, A phase-field method for two-phase fluid flow in arbitrary domains, ***Computers & Mathematics with Applications*** , Vol. 79, 1857-1874, 2020. (Q1)
25. **Junxiang Yang**, Zhijun Tan, Junseok Kim*, High-order time-accurate, efficient, and structure-preserving numerical methods for the conservative Swift-Hohenberg model, ***Computers & Mathematics with Applications*** , Vol. 102, 160-174, 2021. (Q1)

26. **Junxiang Yang**, Jian Wang, Zhijun Tan*, A simple and practical finite difference method for the phase-field crystal model with a strong nonlinear vacancy potential on 3D surfaces, ***Computers & Mathematics with Applications***, Vol. 121, 131-144, 2022. (Q1)
27. Junseok Kim, Zhijun Tan, **Junxiang Yang***, Linear and conservative IMEX Runge–Kutta finite difference schemes with provable energy stability for the Cahn-Hilliard model in arbitrary domains, ***Computers & Mathematics with Applications***, Vol.143, 133-150, 2023. (Q1)
28. **Junxiang Yang**, Jianjun Chen, Zhijun Tan*, Highly efficient variant of SAV approach for two-phase incompressible conservative Allen-Cahn fluids, ***Engineering with Computers***, Vol. 38,
29. **Junxiang Yang**, Zhijun Tan, Sangkwon Kim, Soobin Kwak, Junseok Kim*, Finite volume scheme for the lattice Boltzmann method on curved surfaces in 3D, ***Engineering with***
30. **Junxiang Yang**, Junseok Kim*, Efficient and structure-preserving time-dependent auxiliary variable method for a conservative Allen-Cahn type surfactant system, ***Engineering with***
31. **Junxiang Yang**, Junseok Kim*, Numerical simulation and analysis of the Swift–Hohenberg equation by the stabilized Lagrange multiplier approach, ***Computational and Applied***
32. **Junxiang Yang**, Junseok Kim*, Energy dissipation-preserving time-dependent auxiliary variable method for the phase-field crystal and the Swift-Hohenberg models, ***Numerical***
33. **Junxiang Yang**, Junseok Kim*, Phase-field simulation of Rayleigh instability on a fibre, ***International Journal of Multiphase Flow***, Vol. 105, 84-90, 2018. (Q2)
34. **Junxiang Yang**, Darae Jeong, Junseok Kim*, A fast and practical adaptive finite difference method for the conservative Allen-Cahn model in two-phase flow system, ***International Journal of Multiphase Flow***, Vol. 137, 103561, 2021. (Q2)
35. **Junxiang Yang**, Junseok Kim*, A novel Cahn-Hilliard-Navier-Stokes model with a nonstandard variable mobility for two-phase incompressible fluid flow, ***Computers & Fluids***, Vol. 213, 10455,
36. **Junxiang Yang**, Junseok Kim*, An efficient stabilized multiple auxiliary variables method for the Cahn-Hilliard-Darcy two-phase flow system, ***Computers & Fluids***, Vol. 223, 104948, 2021.
37. **Junxiang Yang**, Junseok Kim*, Numerical study of incompressible binary fluids on 3D curved surfaces based on the conservative Allen-Cahn-Navier-Stokes model, ***Computers & Fluids***, Vol.
38. **Junxiang Yang**, Zhijun Tan, Junseok Kim*, Original variables based energy-stable time-dependent auxiliary variable method for the incompressible Navier-Stokes equation, ***Computers & Fluids***, Vol. 240, 105432, 2022. (Q2)
39. Zhijun Tan, **Junxiang Yang**, Jianjun Chen, Junseok Kim*, An efficient time-dependent auxiliary variable approach for the three-phase conservative Allen-Cahn fluids, ***Applied Mathematics and Computation***, Vol. 438, 127599, 2023. (Q1)
40. **Junxiang Yang**, Junseok Kim*, Consistently and unconditionally energy-stable linear method for the diffuse-interface model of narrow volume reconstruction, ***Engineering with Computers***, DOI: 10.1007/s00366-023-01935-3 (Q1)
41. **Junxiang Yang**, Yibao Li, Junseok Kim*, Phase-field modeling and linearly energy-stable Runge–Kutta algorithm of colloidal crystals on curved surfaces, ***Journal of Computational and Applied Mathematics***, Vol. 443, 115750, 2024. (Q1)
42. Jianqing Li, **Junxiang Yang***, Local volume-conservation-improved diffuse interface model for simulation of Rayleigh-Plateau fluid instability, ***Computer Physics Communications***, Vol. 296,
43. **Junxiang Yang***, Surface phase-field surfactant fluid model and its practical closest point type finite difference computation， ***Computers & Mathematics with Applications***, Vol. 154, 24-38,
44. **Junxiang Yang***, Unconditionally energy-stable linear convex splitting algorithm for the L2 quasicrystals, ***Computer Physics Communications***, Vol. 295, 108984, 2024. (Q1)
45. **Junxiang Yang***, Linear energy-stable method with correction technique for the Ohta–Kawasaki–Navier–Stokes model of incompressible diblock copolymer melt, ***Communications in Nonlinear Science and Numerical Simulation***, Vol. 131, 107835,
46. Yi Zhao, Dongting Cai, **Junxiang Yang***, Second-order accurate and unconditionally stable algorithm with unique solvability for a phase-field model of 3D volume reconstruction, ***Journal of Computational Physics***, Vol. 504, 112873, 2024. (Q1)

47. **Junxiang Yang**, Yibao Li, Junseok Kim*, A structure-preserving projection method with formal second-order accuracy for the incompressible Navier-Stokes equations, ***Communications in Nonlinear Science and Numerical Simulation*** , Vol. 133, 107963, 2024. (Q1)
48. Jingwen Wu, **Junxiang Yang**, Zhijun Tan*, Unconditionally energy-stable time-marching methods for the multi-phase conservative Allen-Cahn fluid models based on a modified SAV approach, ***Computer Methods in Applied Mechanics and Engineering*** , Vol. 398, 115291 2022.

Books

Patents

Professional Certification and Awards

- International Postdoctoral Exchange Fellowship Program (Talent-Introduction Program), 2022.
- Excellent government-sponsored Ph.D. student in South Korea, 2020.

Student Awards

Professional Society Membership

Research Projects

- National Natural Science Foundation of China, Investigator, 2022.
- China Postdoctoral Science Foundation, Investigator, 2022.
- Macau University of Science and Technology Faculty Research Grant (FRG), Investigator, 2023.