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WORKING EXPERIENCE

- | | |
|-------------------|--|
| 04/2023 – present | Postdoctoral Researcher
under the supervision of Prof. Matthias Ihme
Department of Mechanical Engineering,
Stanford University |
| 07/2020 – 04/2023 | Postdoctoral Researcher
with Ph.D. advisors: Prof. HengAn Wu and Prof. FengChao Wang
Department of Modern Mechanics
University of Science and Technology of China |

EDUCATION

- | | |
|-------------------|--|
| 09/2015 – 07/2020 | Ph.D. in Solid Mechanics
University of Science and Technology of China, Hefei, China
Thesis: <i>Mechanical mechanisms of wetting at solid-liquid interfaces and mass transport on the nanoscale</i>
Advisors: Prof. HengAn Wu and Prof. FengChao Wang |
| 09/2011 – 07/2015 | B.E. in Process Equipment and Control Engineering
East China University of Science and Technology, Shanghai, China |

PUBLICATIONS AS FIRST AUTHOR

(# denotes equal contribution, * denotes the corresponding author)

1. **J. Fan**, N. Ly, and M. Ihme*, Heterogeneous cluster energetics and nonlinear thermodynamic response in supercritical fluids, *Physical Review Letters*, 2024, 133: 248001.
2. **J. Fan***, T. Yoon, G. Vignat, H. Li, K. Younes, A. Majumdar, P. Muhunthan, D. Sokaras, T. Weiss, I. Rajkovic, and M. Ihme*, Supercritical ethanol-CO₂ mixtures exhibit microscopic immiscibility: A combined study using X-ray scattering and molecular dynamics simulations, *The Journal of Physical Chemistry Letters*, 2025, accepted.
3. **J. Fan**, J. De Coninck, H.A. Wu* and F.C. Wang*, Microscopic origin of capillary force balance at contact line, *Physical Review Letters*, 2020, 124: 125502.
4. S. Zhao#, C.H. Jiang#, **J. Fan#**, S.S. Hong, P. Mei, R.X. Yao, Y.L. Liu, S.L. Zhang, H. Li, H.Q. Zhang, C. Sun, Z.B. Guo, P.P. Shao, Y.H. Zhu, J.W. Zhang, L.S. Guo, Y.H. Ma, J.Q. Zhang, X. Feng*, F.C. Wang*, H.A. Wu and B. Wang*, Hydrophilicity gradient in covalent organic frameworks for membrane distillation, *Nature Materials*, 2021, 20: 1551-1558.
5. **J. Fan**, J. De Coninck, H.A. Wu* and F.C. Wang*, A generalized examination of capillary force balance at contact line: On rough surfaces or in two-liquid systems, *Journal of Colloid and Interface Science*, 2021, 585: 320-327.

6. **J. Fan**, H.A. Wu* and F.C. Wang*, Evaporation-driven liquid flow through nanochannels. *Physics of Fluids*, 2020, 32: 012001.
7. **J. Fan**, F.C. Wang*, J. Chen, Y.B. Zhu, D.T. Lu, H. Liu and H.A. Wu*, Molecular mechanism of viscoelastic polymer enhanced oil recovery in nanopores. *Royal Society Open Science*, 2018, 5: 180076.
8. **J. Fan**, Y. Hao, J. Chen, X.Z. Li, F.C. Wang and H.A. Wu*, Research progress of micro/nano mechanical problems in unconventional oil and gas exploitation. *Journal of University of Science and Technology of China*, 2017, 47: 142-154. (Invited review)

OTHER PUBLICATIONS

(# denotes equal contribution, * denotes the corresponding author)

1. K.L. Zhang, H.Y. Xu, **J. Fan**, C.C. Ouyang, H.A. Wu and F.C. Wang*, A strategy to drive nanoflow using Laplace pressure and the end effect, *Droplet*, 2024, 3: e136. ([Cover paper](#))
2. X. Huang, Y.Q. Li*, **J. Fan**, H.A. Wu and F.C. Wang*, Impeding effect on droplet spreading by a groove on the substrate, *Capillarity*, 2024, 13: 1-9.
3. X.Y. Hong, X. Jin*, M. Shen, **J. Fan**, H.A. Wu, F.C. Wang*, Enhancement of oil transport through nanopores via cation exchange in thin brine films at rock-oil interface, *Advances in Geo-Energy Research*, 2024, 12: 22-34.
4. J.N. Fan, J. Fan, X.Y. Hong, H.Y. Xu, H.A. Wu*, F.C. Wang*, Exploring wettability variations on minerals surfaces: Insights from spreading coefficient and interaction energy analysis, *Geoenergy Science and Engineering*, 2024, 234: 212672.
5. J.C. Li, K.L. Zhang, **J. Fan**, H.A. Wu*, F.C. Wang*, Boundary slip moderated by interfacial hydrogen bond dynamics, *Microfluidics and Nanofluidics*, 2023, 27: 86.
6. X. Huang, **J. Fan**, H.A. Wu*, F.C. Wang*, Local molecular asymmetry mediated self-adaptive pinning force on the contact line, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 2023, 674: 131987.
7. F.C. Wang, J.H. Qian, **J. Fan**, J.C. Li, H.Y. Xu and H.A. Wu*, Molecular transport under extreme confinement. *Science China Physics, Mechanics & Astronomy*, 2022, 65: 264601. (Invited review, [Cover paper](#))
8. Y. Hou, X.B. Ren, **J. Fan**, G.R. Wang, Z.H. Dai, C.H. Jin, W.X. Wang, Y.B. Zhu, S. Zhang, L.Q. Liu* and Z. Zhang*, Preparation of twisted bilayer graphene via wetting transfer method. *ACS Applied Materials & Interfaces*, 2020, 12: 40958-40967.
9. Y.Z. Yu, **J. Fan**, J. Xia, Y.B. Zhu, H.A. Wu and F.C. Wang*, Dehydration impeding ionic conductance through two-dimensional angstrom-scale slits. *Nanoscale*, 2019, 11: 8449-8457.
10. H.Y. Xu, H. Yu*, **J. Fan**, J. Xia, H. Liu and H.A. Wu*, Formation mechanism and structural characteristic of pore-networks in shale kerogen during in-situ conversion process. *Energy*, 2022, 242: 122992.
11. H. Yu, H.Y. Xu, **J. Fan**, F.C. Wang and H.A. Wu*, Roughness factor-dependent transport characteristic of shale gas through amorphous kerogen nanopores, *Journal of Physical Chemistry C*, 2020, 124: 12752–12765. ([Cover paper](#))
12. H. Yu, H.Y. Xu, **J. Fan**, Y.B. Zhu, F.C. Wang and H.A. Wu*, Transport of shale gas in micro/nanoporous media: Molecular to pore-scale simulations. *Energy & Fuels*, 2021, 35: 911-943. (Invited review, [Cover paper](#))
13. J.C. Li, Y.B. Zhu, J. Xia, **J. Fan**, H.A. Wu* and F.C. Wang*, Anomalously low friction of confined monolayer water with a quadrilateral structure. *The Journal of Chemical Physics*, 2021, 154: 224508.
14. H.Y. Xu, H. Yu*, **J. Fan**, J. Xia, F.C. Wang and H.A. Wu, Enhanced gas recovery in kerogen pyrolytic

- pore-network: Molecular simulations and theoretical analysis. *Energy & Fuels*, 2021, 35: 2253-2267.
15. H. Yu, H.Y. Xu, J. Xia, **J. Fan**, F.C. Wang and H.A. Wu*, Nano-confined transport characteristic of methane in organic shale nanopores: The applicability of continuous model, *Energy & Fuels*, 2020, 34: 9552-9562.
 16. H.Y. Xu, H. Yu*, **J. Fan**, Y.B. Zhu, F.C. Wang and H.A. Wu*, Two-phase transport characteristic of shale gas and water through hydrophilic and hydrophobic nanopores, *Energy & Fuels*, 2020, 34: 4407-4420.
 17. H. Yu, **J. Fan**, J. Xia, H. Liu and H.A. Wu*, Multiscale gas transport behavior in heterogeneous shale matrix consisting of organic and inorganic nanopores. *Journal of Natural Gas Science and Engineering*, 2020, 75: 103139.
 18. Y.Z. Yu, **J. Fan**, A. Esfandiar, Y.B. Zhu, H.A. Wu and F.C. Wang*, Charge asymmetry effect in ion transport through angstrom-scale channels. *Journal of Physical Chemistry C*, 2019, 123: 1462-1469.
 19. H. Yu, **J. Fan**, J. Chen, Y.B. Zhu and H.A. Wu*, Pressure-dependent transport characteristic of methane gas in slit nanopores. *International Journal of Heat and Mass Transfer*, 2018, 123: 657-667.
 20. X.Z. Li, **J. Fan**, H. Yu, Y.B. Zhu* and H.A. Wu*, Lattice Boltzmann method simulations about shale gas flow in contracting nano-channels. *International Journal of Heat and Mass Transfer*, 2018, 122: 1210-1221.
 21. J. Chen, H. Yu, **J. Fan**, F.C. Wang, D.T. Lu, H. Liu and H.A. Wu*, Channel-width dependent pressure-driven flow characteristics of shale gas in nanopores. *AIP Advances*, 2017, 7: 045217.

PRESENTATIONS

1. Microscopic Insight into Capillary Force Balance at Triple Contact Line, the 17th Conference of the International Association of Colloid and Interface Scientists, Brisbane, Australia, June, 2022. (Online)
2. Young's Equation at the Nanoscale: on the Forces within Three-Phase Contact Zone, the 18th U.S. National Congress of Theoretical and Applied Mechanics, Chicago, U.S.A., June, 2018.
3. Forces within Three-Phase Contact Zone: A Mechanical Interpretation of Young's Equation at the Nanoscale, the 9th International Conference on Computational Methods, Rome, Italy, August, 2018.
4. Enhanced Evaporation of Confined Liquid in Nanochannels, Annual Conference of CAS Key Laboratory of Mechanical Behavior and Design of Materials, Hefei, China, January, 2020.
5. Microscopic Origin of Capillary Force Balance at Contact Line, the 17th National Conference on Modern Mathematics and Mechanics, Qingdao, China, October, 2020.
6. Evaporation-driven Liquid Flow through Nanochannels, the 11th National Conference on Fluid Mechanics, Shenzhen, China, December, 2020.
7. Molecular Mechanism of Polymer Flooding at the Dead Ends of Nanopores, the 18th East China Conference on Solid Mechanics, Xiamen, China, November, 2016.

HONORS AND AWARDS

- USTC MoZi Prize for Outstanding Youth (2020)
- Excellent Presentation Award at Annual Conference of CAS Key Laboratory of Mechanical Behavior and Design of Materials (2020)
- USTC Academic Scholarship (2015-2020)
- Outstanding Graduates Award of Shanghai (2015)

REFERENCES

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