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RESEARCH INTEREST

Soil physics; Poromechanics; Phase transitions in porous media.

EDUCATION

Ph.D., Geotechnical Engineering Hunan University, Changsha, China Supervisor: Prof. Chao Zhang	Sept. 2020 – Jul. 2026
B.S., Civil Engineering Hunan University, Changsha, China	Sept. 2016 – Jun. 2020

PUBLICATIONS

Journal Articles (* Corresponding author)

- [1] **Hu, S.**, Zhang, C. *, Li, L., Or, D., Lu, N., & Chen, R. (2026). Fractionation due to soil–water interactions affects global isotopic evapotranspiration partitioning. *Advances in Water Resources*, 105406. [DOI link]
- [2] **Hu, S.**, Zhang, C. *, Li, L., & Lu, N. (2026). Determining soil water structure, density, and viscosity via infrared spectroscopy. *Journal of Engineering Mechanics*, 152(4), 04026002. [DOI link]
- [3] **Hu, S.**, Zhao, N., Zhang, C. *, Li, F., Chen, R., & Or, D. * (2025). Water nanofilms facilitate ice crystal growth across droplets. *Physical Review Letters*, 134(6), 064001. [DOI link]
- [4] **Hu, S.**, Zhang, C. *, Dong, Y., Gou, L., & Chen, R. (2025). Water vapor sorption isotherms of salt-affected soils. *Canadian Geotechnical Journal*, cgj-2024-0426. [DOI link]
- [5] **Hu, S.**, Zhang, C. *, & Lu, N. (2023). Quantifying coupling effects between soil matric potential and osmotic potential. *Water Resources Research*, 59(2), e2022WR033779. [DOI link]
- [6] **Hu, S.**, & Zhang, C. * (2023). A Sorption Isotherm Model for Soil Incorporating External and Internal Surface Adsorption, and Capillarity. *Canadian Geotechnical Journal*, cgj-2022-0386. [DOI link]
- [7] Zhang, C., Lin, X., **Hu, S. ***, & Lu, N. (2025). Predicting the Soil Freezing Curve via a Modified Clapeyron Equation. *Journal of Geotechnical and Geoenvironmental Engineering*, 152(2), 04025195. [DOI link]
- [8] Zhang, C., Zhao, N., **Hu, S. ***, & Lin, X. (2025). Salts retard ice crystal growth in supercooled droplets during recalescence. *Physical Review Fluids*, 10(6), 063605. [DOI link]
- [9] Gou, L., Lu, N., **Hu, S.**, Calderon, A. R. A., & Zhang, C. * (2025). Suction Stress of Soil Slurry. *Journal of Geotechnical and Geoenvironmental Engineering*, 151(2), 04024164. [DOI link]
- [10] Lin, X., Zhang, C. *, **Hu, S.**, & Chen, R. (2024). Heterogeneous ice nucleation of salt solution in porous media. *The Journal of Chemical Physics*, 160(9), 094501. [DOI link]

- [11] Zhang, C., Li, L., **Hu, S.***, Gou, L., & Chen, R. (2024). Physical origin of adsorption heat and its significance in the isotherm equation. *International Journal of Heat and Mass Transfer*, 220, 124914. [DOI link]
- [12] Zhao, N., **Hu, S.**, Zhang, C.*, Li, F., & Chen, R. (2023). Physical Origins of Freezing and Melting Temperature Depressions of Water in Millimeter-sized Pores. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 674, 131851. [DOI link]
- [13] Gou, L., Zhang, C.*, Lu, N., & **Hu, S.** (2023). A Soil Hydraulic Conductivity Equation Incorporating Adsorption and Capillarity. *Journal of Geotechnical and Geoenvironmental Engineering*, 149(8), 04023056. [DOI link]
- [14] Gou, L., Zhang, C.*, **Hu, S.**, Chen, R., & Dong, Y. (2023). Semi-analytical Solutions for Soil Consolidation Induced by Drying. *Acta Geotechnica*, 18(2), 739–755. [DOI link]
- [15] Zhang, C., **Hu, S.**, Qiu, Z., & Lu, N.* (2022). A Poroelasticity Theory for Soil Incorporating Adsorption and Capillarity. *Géotechnique*, 1–18. [DOI link]
- [16] Zhang, C., Gou, L., **Hu, S.***, & Lu, N. (2022). A Thermodynamic Formulation of Water Potential in Soil. *Water Resources Research*, 58(9). [DOI link]
- [17] Zhang, C.*, **Hu, S.**, & Lu, N. (2022). Unified Elastic Modulus Characteristic Curve Equation for Variably Saturated Soils. *Journal of Geotechnical and Geoenvironmental Engineering*, 148(1), 04021171. [DOI link]

PRESENTATIONS

2025 Annual Academic Conference of Chinese Society of Soil Science , Yantai, China	August 2025
Poster: Phase equilibrium and transitions in salt-affected soils	
Ice at the Micro-scale 2025 , Ascona, Switzerland	July 2025
Poster: Salts retard ice crystal growth in supercooled droplets during recalescence	
AGU24 , Washington, D.C., United States	December 2024
Poster: Phase equilibrium and transitions in salt-affected soils	
InterPore2024 , Qingdao, China	May 2024
Oral: Adsorption-induced Effective Stress in Porous Media (On behalf of Prof. Zhang)	
The 4th International Soil Modeling Consortium (ISMC) Conference , Tianjin, China	May 2024
Poster: Coupling Between Soil Matric Potential and Osmotic Potential	
InterPore2023 , Edinburgh, Scotland	May 2023
Poster: A Poroelasticity Theory for Soil Incorporating Adsorption and Capillarity	
The 9th Young Experts Forum on Geotechnical Engineering , Changsha, China	June 2021
Oral: Unified Elastic Modulus Function for Variably Saturated Soils	

ACADEMIC SERVICE

Editorial Board

Vadose Zone Journal, Associate Editor, 2026 - present
Vadose Zone Journal, Social Media Editor, 2025 - 2026

Journal Reviewer

Bulletin of Engineering Geology and the Environment
Communications Earth & Environment
Construction and Building Materials

Geoscientific Model Development
Geotechnical Research
Vadose Zone Journal
Water Resources Research

AWARDS & HONORS

First Prize of AGU Student Award	2024
Unsaturated Zone Technical Committee, American Geophysical Union	
National Scholarship for Graduate Students	2024
Ministry of Education, China	
Engineering Innovation Design Scholarship	2022
Hunan University	
Second Prize, Outstanding Innovative Undergraduate Thesis	2020
Hunan University	
First-Class Scholarship	2018
Hunan University	