

Zijian Qin

Supervisor: Hongxia Xu, Associate Professor of Hydrogeology, Nanjing University

Tel : (86) 18946587792 ; Email : mg21290075nju@outlook.com

163 Xianlin Road, Qixia District, Nanjing, 210023, China



EDUCATION

Oct 2021- Jun 2024 (Expected)	Nanjing University Nanjing, China	M.S., Hydrology and Water Resources GPA 88.1 Focus on environmental behaviors of microplastics B.S., Groundwater Science and Engineering GPA 3.27 (top 2 / 39) Focus on numerical modeling of Hydrology/Hydrogeology
Sep 2017- Jun 2021	Jilin University Changchun, China	

PUBLICATIONS

Qin, Z., Xu, H., Li, X., Ma, X., Wu, J. Effect of microbial adhesion and biodegradation on phenanthrene sorption onto microplastics. (2023). Submitted to ***Journal of Hazardous Materials (Under Review)***

Qin, Z., Yang, Q., Wang, H., Gu, Q., Lu, W. A Kriging-based simulation-optimization framework to optimize multiphase extraction system for LNAPL remediation. (2023). ***Science of the Total Environment (In Revision)***

RESEARCH EXPERIENCES

- Oct 2021-
Present
- Under my supervisor's guidance, I investigated the **adsorption behavior** of microplastics (MPs) on the hydrophobic organic contaminant phenanthrene (PHEN). The results have implications for assessing the ecological risks associated with microplastics and their associated contaminants. (National Natural Science Foundation of China)
- **Batch experiments** was conducted to explore the impact of **biofilm adhesion** and **biodegradation** on the adsorption of hydrophobic organic compounds by microplastics;
 - Different **characterization techniques** were used to explore the variation of physiochemical properties of pristine and bio-aged MPs including field emission scanning electron microscope, optical contact angle goniometer, FTIR spectroscopy, nitrogen physisorption;
 - Utilized **high-throughput sequencing** to investigate the link between physical and chemical properties of different microplastics and microbial communities;
 - **Dual-mode model** was used to describe the sorption of PHEN onto MPs and provide some insights in interpreting the **adsorption mechanisms**;

- Environmental behaviors of microplastics**
- I also focused on investigating the **fate and transport** behaviors of microplastics in **natural porous media**. This research sheds light on the potential risks of plastic particles in soils and their potential contamination of groundwater, contributing to our understanding of microplastics' behavior in natural systems.
- Conducting **column experiments** to explore the stability and transport of pristine and **biofilm-coated** microplastics under varying ionic strengths in the presence and absence of **phenanthrene (PHEN)**;
 - Investigated how environmentally relevant aquifer medium (**surface heterogeneity caused by biofilm coating**), with wild microbiota extracted from sediment in a freshwater lake, affects the transport of microplastics.

- Jun 2019-
Jun 2021
- My Bachelor's thesis focused on **LNAPL remediation and optimization** using **multiphase extraction (MPE)**. A Kriging-based **simulation-optimization (KSO)** framework combining Kriging surrogate model (KSM) and genetic algorithm (GA) was proposed to optimize the MPE process and improve the efficiency of LNAPL remediation. This research can assess the applicability and performance of the proposed KSO framework in improving the efficiency and cost-effectiveness of LNAPL remediation. (National Key Research and

Development Program of China)

- Establishing the **numerical model** of LNAPL transport and benzene removal by MPE in a hypothetical benzene-contaminated site;
- Determining the well configuration and **decision variables** based on the **sensitivity** and given scenarios analysis;
- Constructing a **surrogate model** which was applied to the established numerical model of MPE to reduce the computational load;
- Obtaining the optimal solutions of MPE process parameters through **genetic algorithm** (GA).

Numerical modeling of Hydrology/ Hydrogeology

I also joined in **National Undergraduate Training Programs for Innovation and Entrepreneurship**, focusing on **modeling uncertainty in groundwater risk assessment**.

- Established numerical simulation models, including groundwater flow and **solute transport** models, to study groundwater pollution.
- Utilized the **Monte Carlo** method to analyze **parameter uncertainties** and their impact on simulation outcomes.
- Employed **Kriging surrogate models** to reduce computational load and enhance efficiency in predicting groundwater pollution.

CONFERENCE ATTENDANCES

Sep 2022	49th International Association of Hydrogeologists (IAH) CONGRESS 2022	Poster presentation
	Poster theme: Effect of microbial adhesion and biodegradation on phenanthrene sorption onto microplastic.	

AWARDS AND SCHOLARSHIPS

2022-2023	Graduate Students Academic Scholarship / 2 nd Prize (top 10%), Nanjing University
2021-2022	Graduate Students Academic Scholarship / 2 nd Prize (top 10%), Nanjing University
Jun 2021	Outstanding Graduate (Excellent graduation thesis), Jilin University
2020-2021	First Class Scholarship (University Excellent Student), Jilin University
2019-2020	First Class Scholarship (University Excellent Student), Jilin University
2018-2019	First Class Scholarship (University Excellent Student), Jilin University
2018-2019	Student Activities Scholarship, Jilin University
2017-2018	Second Class Scholarship (College Excellent Student), Jilin University

SKILLS

Languages	English (IELTS 7.0), Chinese (Native)
Programming	Matlab
Software	Hydrus, GroundwaterModeling System (GMS), TMVOC (Petrasm), Image J, Origin
Experimental instruments	UV-Vis, HPLC, GC, SEM-EDS, Zetasizer, Specific surface area and pore size analyzer, Optical contact angle goniometer