Yanan Pan, Ph.D.

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EDUCATION

Virginia Polytechnic Institute and State University Blacksburg, United States
Ph.D. in Mining and Minerals Engineering May 2026

- Fields: Desalination, Critical Mineral Extraction, Resource Recovery, Carbon Mineralization

East China University of Science and Technology Shanghai, China
M.S. in Resource and Environment June 2023

- Fields: Desalination, Functional Material Development, Critical Mineral Extraction, Reactor Design
- Dissertation: High Uniformity Preparation of Aluminum-based Layer Lithium Adsorbents and Synchronous Extraction of Lithium and Boron Resources

Jiangsu University of Science and Technology Changzhou, China
B.S. in Environmental Engineering June 2020

ACADEMIC EXPERIENCE

University of Kentucky Aug 2026 - Present
Tenure-track Assistant Professor, Mining Engineering
Joint Appointment in Materials Engineering

- Conduct research on critical mineral extraction and recovery.
- Develop selective separation processes for lithium and rare earth elements.
- Advance adsorption-based and sustainable resource recovery technologies.

Virginia Polytechnic Institute and State University May 2026-July 2026
EHire Researcher

- Led critical mineral extraction and recovery projects, overseeing experimental design, data analysis, and technical reporting
- Mentored Ph.D. students on experimental planning, laboratory procedures, data interpretation, and troubleshooting

Virginia Polytechnic Institute and State University Sept 2023-May 2026
Graduate Research Assistant

- Reviewed relevant literature and developed experimental plans aligned with project milestones
- Executed experiments, analyzed results, and compiled comprehensive project reports
- Collaborated closely with project team members to meet goals set by the project manager
- Engaged in ongoing technical discussions to troubleshoot challenges and optimize outcomes

East China University of Science and Technology Sept 2020-July 2023
Graduate Research Assistant

TEACHING EXPERIENCE

Graduate Teaching Assistant Department of Mining & Minerals Engineering, Virginia Tech，Fall 2023

Fluids and Thermodynamics for Resources (Credit hours: 3.0. Enrollment: 19)

- Assisted with preparing lecture slides, assignments, and supplementary teaching materials.
- Held office hours to address student questions.
- Graded homework, quizzes, and exam.
- Proctored midterm and final examinations, ensuring academic integrity.

Miner Power Systems & Automation (Credit hours: 3.0. Enrollment: 13)

- Coordinated course logistics and preparing class handouts.
- Assisted students with understanding applied concepts in power systems and automation.
- Evaluated student performance through grading.

PROJECT EXPERIENCE

Virginia Polytechnic Institute and State University Sept 2023-June 2026

- Kings Mountain Lithium Materials Processing Plant. (Funded by Albemarle US Inc. (DOE flowthrough); Project Number: DE-MS0000001; Performance Period: 06/15/2023 – 06/14/2027; Funding: $1,500,000 total, $1,500,000 agency share, $0 cost share; Investigators: Aaron Noble (PI, 50% responsibility, $750,000), Wencai Zhang (Co-PI, 50% responsibility, $750,000)). Status: Ongoing. Main participant.
- Resource Assessment of Geological Formations and Mine Waste for Carbon Dioxide Mineralization in the US Mid-Atlantic. (Funded by DOE/NETL; Project Number: DE-FE0032247; Performance Period: 09/01/2023 – 08/31/2025; Funding: $1,249,362 total, $999,432 agency share, $249,930 cost share; Investigators: PI: Bahareh Nojabaei; Co-PIs: Wencai Zhang (20% responsibility, $199,886), Rohit Pandey, Ryan Pollyea, Nino Ripepi). Status: Ongoing. Main participant.
- Valuable Mineral Recovery and Alternative Utilization of Produced Water through a Novel Process. (Funded by DOE/NETL; Project number: DE-FE0032492; Performance period: 10/1/2024-9/30/2027; Funding: $1,875,339 total, $1,500,000 federal, $375,339 cost share; Investigator: Wencai Zhang (PI, 100% responsibility, $1,500,000)). Status: Ongoing. Main participant.

East China University of Science and Technology Sept 2020-July 2023

- Study and Demonstration on Preparation Technology of High-Quality Lithium Carbonate from Deep Brine Raw Materials. (Major Science and Technology. Funded by Qinghai Province, China; Performance Period: 2019-2022; PI: Lin Sen (2500,000 RMB)). Status: Done. Main participant.
- Adsorption and Membrane Coupling Separation of Low Concentration High Mg-Li Ratio Brine Engineering and Demonstration. (Key Research and Development Plan Subproject, Performance Period: 2018-2021; PI: Lin Sen (1470,000 RMB)). Status: Done. Main participant.

INTERNSHIP AND TEAMWORK EXPERIENCE

SABIC SHANGHAI Jan 2021- July 2021
EHSS Department

- Assisted departmental staff in enhancing communication and optimizing chemical safety workflows
- Collaborated on auditing the entry and exit of chemical materials to ensure compliance and accuracy
- Gained hands-on experience in data analysis and information integration related to chemical inventory management
- Developed a strong appreciation for teamwork through cross-functional collaboration

China State Shipbuilding Corporation July 2022- Sept 2022
Product Aftermarket Department

- Managed after-sales issue tracking and summarized common problems related to desulfurization and denitrification equipment
- Organized payroll and administrative records for product service operations
- Coordinated cross-departmental meetings to facilitate communication and resolve technical or service-related issues

OUTREACH AND ENGAGEMENT

Lab Tour Guide Virginia Tech, Mar 2025

Spring 2025 CenTiRe Industry Advisory Board Meeting

- Hosted laboratory tour for industry representatives and faculty during the IAB (Industrial Advisory Board) meeting
- Delivered on-site presentations on advanced mineral processing and sustainable mining technologies, including solvent extraction, carbon mineralization, adsorption, and leaching
- Engaged in technical discussions with professionals from academia and industry
- Practiced science communication in a public-facing setting, effectively conveying complex concepts to diverse audiences

Research Instructor Virginia Tech, Jan 2025-present

- Supervised undergraduate students in laboratory sessions, providing hands-on instruction on experimental procedures and safety protocols
- Explained complex scientific concepts in an accessible manner to enhance student understanding and engagement
- Assisted students in troubleshooting experimental issues and interpreting data results
- Promoted good laboratory practices, including accurate record-keeping, equipment handling, and chemical safety
- Contributed to creating a collaborative learning environment and supported student development through one-on-one mentoring

HONORS AND AWARDS

- **First Place Award**, SME Graduate Student Research Poster Contest, 2026. National competition recognizing excellence in graduate research in mining and critical minerals.
- **Bishop Family Pylon Graduate Fellowship (First Recipient)**, Department of Mining and Minerals Engineering, Virginia Tech, Spring 2026. (Departmental fellowship recognizing academic excellence, professional conduct, and service; includes a supplemental stipend of $2,345.)
- **Best Paper Award,** Green and Smart Mining Engineering Journal, 2025.
- **Outstanding Reviewer Award,** Green and Smart Mining Engineering Journal, 2025. (Recognized for exceptional peer-review contributions and service to the journal)
- **Certificate of Recognition**, Virginia Tech – Office of Research and Innovation, Apr. 2025. (Recognized for disclosing a novel technology in FY2024, contributing to university innovation and tech transfer efforts)
- **Outstanding PhD Student Award**, Department of Mining and Minerals Engineering, Virginia Tech, 2025
- **Second Runner-Up**, NNCI NTEC National Innovation Program, NanoEarth Site, supported by NSF (TechConnect-affiliated innovation competition), 2025
- **Nominee**, Outstanding Doctoral Student Award, College of Engineering, Virginia Tech (nominated by Dr. Wencai Zhang), 2025
- **NNCL Nanotechnology Entrepreneurship Challenge Award** ($1,000), 2025
- **Honorable Mention**, NNCL "Plenty of Beauty at the Bottom" Image Contest – Most Unique Capability Category, 2024
- **Pratt Fellowship** ($500), Virginia Tech, 2024–2025
- **Young Scholarship** ($300), WAAIME, 2024–2025
- **Outstanding Graduate**, City of Shanghai, China, 2023
- **Special Prize**, The 18th "Challenge Cup" Shanghai University Students' Extracurricular Academic and Technological Works Competition, China, 2023
- ***National Scholarship***, Ministry of Education, China, 2023
- **First-grade Scholarship and Outstanding Student**, East China University of Science and Technology, 2021
- **Excellent Student Cadre**, Jiangsu University of Science and Technology, China, 2018

PUBLICATIONS **(TOTAL: 22 | FIRST AUTHOR: 16 | CITATIONS: 444 | H-INDEX: 15)**

1. **Pan, Y.**, Zhang, Y., Liu, G., Zhan, W., Zhang, W. Selective Lithium Recovery via Photothermal Evaporation and Hydration‐Controlled Adsorption. *Advanced Science*, 2026, e20066. (IF = 14.1)
2. **Pan, Y.**, Zhang, Y., Thompson, C., Liu, G., Zhang, W. Electro-spun Lithium Porous Nano-sorbent Fibers for Enhanced Lithium Adsorption and Sustainable Applications. *ACS Applied Materials & Interfaces*, 2024. (IF = 8.2)
3. **Pan Y.**, Ji B., Zhang W. Charge transfer-driven enhanced lithium extraction using poly(acrylic) acid-modified layered double hydroxide. *Chemical Engineering Journal*, 2024, 494: 152939. (IF = 13.2)
4. **Pan, Y.**, Zhang, W. Enhanced continuous lithium extraction using self-designed porous Nano sorbent fibers in a fixed-bed system: Optimization and mechanistic insights. *Desalination*, 2024, 118223. (IF = 9.8)
5. **Pan Y.**, Du J., Chen J., et al. Interlayer intercalation of Li/Al-LDHs responsible for high-efficiency boron extraction. *Desalination*, 2022, 539. (IF = 9.8)
6. **Pan Y.,** Zhang Y., Su H. et al. Enhancing lithium extraction from low grade Salt Lake brines using high powder loading aluminum-based adsorbent granules. *Desalination*, 2024, 117696: 117696. (IF = 9.8)

7. **Pan, Y.,** Zhan, W., Zhang, W. Advanced computational strategies for lithium chemical and electrochemical adsorption: A comprehensive state-of-the-art review. *Desalination*, 2025, 600, 118524. (IF = 9.8)
8. **Pan, Y.;** Zhan, W.; Honaker, R.; Zhang, W. pH-regulated inner-sphere coordination for selective Fe(III) removal over rare-earth elements from acidic leachates using a D2EHPA-based resin. *Separation and Purification Technology*, 2026, 140463. (IF = 9.1)
9. **Pan Y.**, Tao H., Su H. et al. High mixing enhancement for continuous uniformity Li/Al-LDHs in lithium extraction from low grade salt lakes. *Separation and Purification Technology*, 2024, 129282: 129282. (IF = 9.1)
10. **Pan, Y.**, Zhang, W. Impurity Shielding in Li/Al-LDH-Based Lithium Recovery from Produced Water via Activated Carbon Pretreatment. *ACS Sustainable Chemistry & Engineering*, 2025. (IF = 7.3)
11. **Pan Y.**, Ji B., Nojabaei B. et al. Investigating CO_2 mineralization of fine mafic minerals: Insights into reaction characteristics and physicochemical attributes. *Journal of Environmental Chemical Engineering*, 2025, 13(3): 116827. (IF = 7.2)
12. **Pan Y.**, J. Yu, S. Lin. A rational strategy for synchronous extraction of lithium and boron from Salt Lake brines, *Chemical Engineering Science*. 2023, 276. (IF = 4.3)
13. **Pan, Y.**, Zhan, W., Zhang, W. Sustainable lithium extraction from produced water: Integrating membrane pretreatment and next-generation adsorbents. *Journal of Environmental Management*. 2025, 382, 125343. (IF = 8.4)
14. **Pan Y.**, Yin S., Yu J., Lin S. Efficient Step-by-Step Desorption to Reduce Boron in Brine Lithium Extraction. *Industrial & Engineering Chemistry Research*, 2023. (IF = 3.9)
15. **Pan, Y.**, Ji, B., Zhang, W., Knott, K., Xia, Y., Li, Q., Rena, B. Topography and structural regulation-induced enhanced recovery of lithium from shale gas produced water via polyethylene glycol functionalized layered double hydroxide. *Journal of Industrial and Engineering Chemistry*, 2024. (IF = 6.0)
16. **Pan Y.**, Ji B., Zhang W. et al. Selective extraction of lithium from shale gas produced water using an aluminum-based adsorbent. *Green and Smart Mining Engineering*, 2024.
17. Lin S., **Pan Y.**, Du J. et al. Double-edged role of interlayer water on Li^+ extraction from ultrahigh Mg^{2+}/Li^+ ratio brines using Li/Al-LDHs. *Journal of Colloid Interface Science*, 2022, 627: 872-879. (IF = 9.7)
18. Zhan, W., Yuan, Y., Weng, Q., **Pan, Y.**, Song, S., Arauz-Lara, J. L., Jia, F., Zhang, W. Enhanced trace gadolinium (III) extraction via tailored chemisorption on defect-engineered molybdenum disulfide electrodes. *Chemical Engineering Journal*, 2025, 162632. (IF = 13.2)
19. Chen X., Ma X., **Pan Y.**, et al. Dissipation, transformation and accumulation of triclosan in soil-earthworm system and effects of biosolids applicatio. *Science of Total Environment*, 2020, 712: 136563. (IF = 8.0)
20. Chen X., Gu X., Zhao X, Wang Y, **Pan Y.**, et al. Species-dependent effects of earthworms on the fates and bioavailability of tetrabromobisphenol A and cadmium coexisted in soils. *Science of Total Environment*, 2019, 658: 1416- 1422. (IF = 8)
21. Chen X., Gu X., Zhao X., Ma X., **Pan Y.**, et al. Species-dependent toxicity, accumulation, and subcellular partitioning of cadmium in combination with tetrabromobisphenol A in earthworm. *Chemosphere*, 2018, 210: 1042- 1050.
22. Zeng L., Deng S., **Pan Y.**, Zhang W. Sustainable preparation of battery-grade $FePO_4 \cdot 2H_2O$ from acid mine drainage through a precipitation-purification pathway. *Resources, Conservation and Recycling*, 2026, 225: 108643. (IF = 10.9)

PATENTS (TOTAL:7)

Virginia Polytechnic Institute and State University

- Wencai Zhang, **Yanan Pan**. Compositions and Methods for Polymer-modified Lithium/aluminium Layered Double Hydroxide (Li/Al-LDH). U.S. Provisional Patent Application No. 63/654,487; Filed May 31, 2024. (Submitted)
- Wencai Zhang, **Yanan Pan**. Fabrication of Electrospun Nanosorbent Fibers for Efficient Lithium Extraction. VT IP Disclosure. Number: 24-133. (IP Disclosure)

East China University of Science and Technology

- Sen Lin, **Yanan Pan**, Yihong Guo, Jianguo Yu. A Method of Simultaneous Extraction of Lithium and Boron Resources in A Boron-rich Lithium-Containing System. PCT/CN2023/076724.
- Sen Lin, **Yanan Pan**, Jun Chen, Jianguo Yu. High Mixing Continuous Rotary Reactor and Its Preparation of Lithium Aluminum Adsorbent (Li/Al-LDHs). China Patent Office, open no.: CN 114832762 A.
- Sen Lin, **Yanan Pan**, Yihong Guo, Jianguo Yu. A Method of Simultaneous Extraction of Lithium and Boron Resources in A Boron-rich Lithium-Containing System. China Patent Office, open no.: CN 115814466 A.

Jiangsu University of Science and Technology

- Xian Chen, Xuan Ma, **Yanan Pan**, et al. An Invention Disclosing a Preparation Method for Simultaneous Synthesis of Tetrabromobisphenol a Monomethyl ether and dimethyl ether. China Patent Office, open no.: CN 111153774A.

BOOK

Yanan Pan (Co-editor). Advanced Adsorption Technologies for Direct Lithium Extraction. Springer, currently in preparation (manuscript in progress), expected 2026.

CONFERENCE PRESENTATIONS

MINEXCHANGE 2026 SME Annual Conference & Expo Salt Lake City, USA, Feb 22–25, 2026

- Oral Presentation: “Photothermal Evaporation Coupled with Hydration-Controlled Adsorption for Selective Lithium Recovery”
- Oral Presentation: “Sequential Recovery of Iron and Rare Earth Elements from Coal-Derived Acid Leachate via Dual-Adsorbent Strategy”
- Poster Presentation: “pH-Regulated Inner-Sphere Coordination Driving Fe(III) Selectivity over Rare-Earth Elements in Acidic Leachates”

ACS Fall 2025 Washington DC, USA, Aug 17–21, 2025

- Oral Presentation: “Impurity Shielding in Li/Al-LDH-Based Lithium Recovery from Produced Water via Activated Carbon Pretreatment”

ACS Spring 2025 San Diego, USA, Mar 22–27, 2025

- Oral Presentation: "Charge Transfer-driven Enhanced Lithium Extraction from Produced Water using Poly(acrylic) Acid-modified Li/Al-LDH"
- Oral Presentation: "Enhanced Lithium Extraction through Innovative Nanosorbent Fibers: Structure Optimization and Application"

Critical Materials Symposium-BRIGHT Institute Greensboro, USA, Mar 6, 2025

- Poster Presentation: "Enhanced Lithium Extraction through Innovative Nanosorbent Fibers"

ACS CERM 2024 Pittsburgh, USA, Nov 5–9, 2024

- Oral Presentation: "Separation and Recovery of Trace Rare Earth Elements via Controlled Chemisorption and Electrosorption Processes"

MINEXCHANGE 2024 SME Annual Conference & Expo Phoenix, USA, Feb 23–28, 2024

- Poster Presentation: "Unlocking Lithium Resources in Shale Gas Produced Water through Selective Adsorption using an Aluminum-Based Adsorbent"

WORKSHOP& TRAININGS

AFM Workshop Virginia Tech, Aug 2025

- Hands-on training on Atomic Force Microscopy (AFM) operation, imaging, and data interpretation
- Practiced sample preparation and advanced imaging modes for nanoscale characterization

NCFL 2025 Fall Workshop Virginia Tech, Sept 2025

- Participated in hands-on rotations on advanced instruments, including SEM, FIB/SEM, TEM, EPMA, Nanofabrication, and Raman/SEM (RISE) system
- Gained experience in sample preparation, imaging, and data analysis workflows under expert guidance

PEER-REVIEW EXPERIENCE

Total Number: 30

Journals: *Carbon Energy*, *Water Environment Research*, *Desalination*, *Mining Engineering*, *Green and Smart Mining Engineering*, *Mining, Metallurgy & Exploration, Environmental Progress & Sustainable Energy, water air & soil pollution, Waste and Biomass Valorization, Journal of Environmental Chemical Engineering, Water Environment Research, Water Research*

AFFILIATIONS

- Member, American Chemical Society (ACS), 2024–Present
- Member, Society for Mining, Metallurgy & Exploration (SEM), 2023–Present