

Peter K. Kang

Associate Professor, McKnight Presidential Fellow & Gibson Chair of Hydrogeology
Department of Earth and Environmental Sciences, University of Minnesota, Twin Cities
116 Church St SE, 150 John T. Tate Hall, Minneapolis, MN 55455, USA
Email: pkkang@umn.edu

Education and Professional Career

2008 B.A., Civil, Urban and Geosystem Engineering, Seoul National University, South Korea
2010 M.S., Civil & Environmental Engineering, Massachusetts Institute of Technology (MIT), USA
2014 Ph.D., Hydrology / Civil & Environmental Engineering, MIT, USA
2014–2018 Postdoctoral Fellow, MIT (2014–2015); Researcher, Korea Institute of Science and Technology (2015–2018)
2018–present Associate Professor, University of Minnesota (2023–present); Assistant Professor (2018–2023)

Commitment, Appointments and Scientific Volunteer Jobs

2024–present Associate Editor, ARC Geophysical Research (2021–2024: Associate Editor, Hydrogeology Journal)
2025–2026 Minisymposium Organizer, InterPore Annual Meetings (InterPore2025: “Advances in Carbon Mineralization”; InterPore2026: “Pore-Scale Physics and Modeling,” 110 abstracts)
2018–present Session Convener, American Geophysical Union (AGU) Fall Meeting —, “Coupled Flow Processes in Fractured Media Across Scales” (since 2018) and “Reactive Transport and Chemo-Mechanical Processes in Porous Media” (since 2022)
Member: American Geophysical Union (AGU), InterPore, Minnesota Ground Water Association

Professional Awards, Offers and Recognitions

2025 InterPore Mid-Career Achievement Award
2023 McKnight Presidential Fellow Award, University of Minnesota
2022 Chin-Fu Tsang Coupled Processes Award, CouFrac
2021 National Science Foundation (NSF) Early CAREER Award
2021 ACS PRF Doctoral New Investigator Award
2019 3M Company, Non-Tenured Faculty Award

Most important Publications (maximum 10)

- [1] Budek, A., Szymczak, P., and Kang, P. K.* (2026). Fractures Regulate Coupled Dissolution–Precipitation Dynamics: Regime Map, Optimal Fracture Conductance, and Clogging, *Earth and Planetary Science Letters*. 690, p.120163.
- [2] Deng, J., Pyrak-Nolte, L.J., Kang, P.K.* (2026). Geologic stress modulates fluid mixing at fracture intersections. *Communications Earth & Environment*, 7:463.
- [3] Lee, S.H., Moura, M., Srivastava, S., Santelli, C., Kang, P.K.* (2025). Filamentous fungi control multiphase flow and fluid distribution in heterogeneous porous media. *Nature Physics*. doi.org/10.1038/s41567-025-03020-6
- [4] Soucey, C., Sutton, C., Yang, W., Zahasky, C., Kang, P. K.* (2025), Deciphering Solute and Reactive Transport in Triple Porosity Systems: Etched Rock Core Experiments and Numerical Modeling, *Environmental Science & Technology*, 59(29), 15364-15374.
- [5] Chen, M.A., Lee, S.H., Kang, P.K.* (2024). Inertia-induced Mixing and Reaction Maximization in Laminar Porous Media Flows. *Proc. Natl. Acad. Sci. USA*, 121(50), e2407145121.
- [6] Yang, W., Chen, M.A., Lee, S.H., Kang, P.K.* (2024). Fluid inertia controls mineral precipitation and clogging in pore to network-scale flows. *Proc. Natl. Acad. Sci. USA*, 121(28), e2401318121.
- [7] Lee, S.H., Secchi, E., Kang, P.K.* (2023). Rapid formation of bioaggregates and morphology transition to biofilm streamers induced by pore-throat flows. *Proc. Natl. Acad. Sci. USA*, 120(14), e2204466120.
- [8] Yoon, S., Dentz, M., Kang, P.K.* (2021). Optimal Fluid Stretching for Mixing-limited Reactions in Rough Channel Flows. *Journal of Fluid Mechanics*, 916, A45.

- [9] Lee, S.H., Kang, P.K.* (2020). Three-dimensional Vortex-induced Reaction Hotspots at Flow Intersections. *Physical Review Letters*, 124(14), 144501. (PRL Editors' Suggestion)
- [10] Kang, P.K.*, Lei, Q., Dentz, M., Juanes, R. (2019). Stress-induced anomalous transport in natural fracture networks. *Water Resources Research*, 55(5), 4163-4185.