

Christophe J.G. Darnault

Environmental Engineering and Earth Sciences
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A. EDUCATION AND TRAINING

Institution, Location	Major	Degree/Year
Institut Supérieur d'Agriculture, Lille, France	Agricultural, Environmental and Biological Engineering	Combined M.S.&B.S. (Diplôme d'Ingénieur), 1995
Cornell University, Ithaca, NY	Environmental and Water Resources Engineering	Ph.D., 2000

B. RESEARCH AND PROFESSIONAL EXPERIENCE

2019-Present	Associate Professor (with tenure), Department of Environmental Engineering and Earth Sciences, Clemson University, Clemson, SC
2013-2019	Assistant Professor, Department of Environmental Engineering and Earth Sciences, Clemson University, Clemson, SC
2012-2013	Guest Researcher, Department of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, Troy, NY
2004-2012	Assistant Professor, Department of Civil and Materials Engineering, University of Illinois at Chicago, Chicago, IL
2003-2004	Water Resources Group Leader, Environmental Engineering & Technology, Inc., Newport News, VA
2000-2003	Project Engineer, Malcolm Pirnie Inc., Newport News, VA

C. SYNERGISTIC ACTIVITIES

1. The overall goal of Christophe Darnault's research is to find sustainable engineering solutions for the management of soil and water resources, while protecting ecosystems and human health. His research focuses on soil physics and vadose zone hydrology, water quality, fate and transport of contaminants in the subsurface, agricultural and biological engineering, and environmental and water resources engineering and management. It specifically addresses the hydrological, microbiological, and geochemical processes impacting soil and water, combining laboratory experiments, modeling, and field investigations to provide a comprehensive understanding of the environmental fluid dynamics, multiphase flow/transport, and biogeochemical processes governing the behavior, fate, and transport of contaminants. He developed novel tools, sensors and methods for the detection and monitoring of biological/environmental systems and processes in soil and water environment.
2. Dr. Darnault is developing a comprehensive curriculum in ecological engineering to be integrated with hydrogeology and environmental engineering curriculum at Clemson University. Dr. Darnault teaches undergraduate and graduate courses in Biosystems Engineering, including **Ecohydrology; Engineering Systems for Soil Water Management; Ecological Engineering;** and **Biosystems Engineering Capstone Design.**
3. Dr. Darnault hydrogeosciences and biological engineering research laboratory aims at characterizing hydrological fluxes and environmental dynamics, and to understand mechanisms responsible for their variability in time and space.

4. Dr. Darnault serves as Associate Editor for *Frontiers in Environmental Science - Soil Processes* (2018-present), and served as Associate Editor for *Journal of Hydrology* (2011-2017).
5. Dr. Darnault is a member of AGU, EGU, and ASABE. He is one of Clemson's representatives for CUAHSI. He is chair of the South Carolina Section ASABE, (2018-present).

D. SELECTED REFERRED PUBLICATIONS

1. Li, C., Hassan, A., Palmai, M., Xie, Y., Snee, P., Powell, B., Murdoch, L., Darnault, C.J.G., "Experiments and Simulations of Transport of Nanocrystal CdSe/ZnS Quantum Dots in Porous Media: Effects of Electrolytes, Organic Ligand, and Natural Organic Matter," *Science of the Total Environment*, 897, 165387 (2023).
2. Daniel, T.J., Richendrfer, J., Falta, R., Murdoch, L., Lin, H., Darnault, C.J.G., "Hydrogeologic and Geomorphic Processes in a Karst Landscape and Seasonably-cold Climate: Linking Spatial Distribution and Morphometric Dynamics of Closed Depressions to Bedrock Fractures in a Wastewater Spray Irrigated Agricultural and Forest System Located at the Site of the Living Filter in Central Pennsylvania, United States," *Agricultural Water Management*, 279, 108170, (2023).
3. Pales, A.R., Li, B., Clifford, H.M., Kupis, S., Edayilam, N., Montgomery, D., Liang, W., Dogan, M., Tharayil, N., Martinez, N., Moysey, S., Powell, B., Darnault, C.J.G., "Preferential Flow Systems Amended with Biogeochemical Components: Imaging of a Two-dimensional Study," *Hydrology and Earth System Sciences*, 22, 2487-2509, (2018)
4. Li, B., Pales, A.R., Clifford, H.M., Kupis, S., Hennessey, S., Liang, W., Moysey, S., Powell, B., Finneran, K.T., Darnault, C.J.G., "Preferential Flow in the Vadose Zone and Interface Dynamics: Impact of Microbial Exudates," *Journal of Hydrology*, 558: 72–89, (2018)
5. Baveye, P.C., and Darnault, C., "Microbial competition and evolution in natural porous environments: Not that simple," *Proceedings of the National Academy of Sciences of the United States of America*, **114**(14): E2802-E2803 doi:10.1073/pnas.1700992114 (2017).
6. Peng, Z., Tian, F., Wu, J., Huang, J., Hu, H., and Darnault, C.J.G., "A Numerical Model for Water and Heat Transport in Freezing Soils with Non-Equilibrium Ice-Water Interfaces," *Water Resources Research* **52**, doi:10.1002/2016WR019116 (2016).
7. Uyusur, B., Li, C., Baveye, P.C., and Darnault, C.J.G., "pH-dependent Reactive Transport of Uranium(VI) in Unsaturated Sand," *Journal of Soils and Sediments*, **15**(3): 634-647 (2015).
8. Godinez, I.G., and Darnault, C.J.G., "Aggregation and Transport of Nano-TiO₂ in Saturated Porous Media: Effects of pH, Surfactants and Flow Velocity," *Water Res*, **45**, 839-851, 2011.
9. Darnault, C.J.G., Steenhuis, T.S., Kim, Y.J., Garnier, P., Jenkins, M., Ghiorse, W.C., Baveye, P.C., and Parlange, J.-Y., "Preferential Flow and the Transport of *Cryptosporidium parvum* Oocysts Through the Vadose Zone: Experiments and Modeling," *Vadose Zone Journal*, **3**, 262-270 (2004).
10. Darnault, C.J.G., DiCarlo, D.A., Bauters, T.W.J., Jacobson, A.R., Throop, J.A., Steenhuis, T.S., Parlange, J.-Y., and Montemagno, C.D., "Measurement of Fluid Contents by Light Transmission in Transient Three-Phase Oil-Water-Air Systems in Sand," *Water Resources Research*, **37**, 1859-1868 (2001).
11. Garnier, P., Angulo-Jaramillo, R., DiCarlo, D.A., Bauters, T.W.J., Darnault, C.J.G., Steenhuis, T.S., Parlange, J.-Y., and Baveye, P., "Dual-Energy Synchrotron X-Ray Measurements of Rapid Soil Density and Water Content Changes in Swelling Soils During Infiltration," *Water Resources Research*, **34**, 2837-2842 (1998).