



CIVIL & ENVIRONMENTAL ENGINEERING SEMINAR SERIES

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Resolving difficult hydrological transport problems with particle tracking

Particle tracking is a Lagrangian technique for numerical solution of conservative transport problems that resolves a number of difficulties faced by more traditional Eulerian (control volume) approaches. In particular, it avoids numerical instability and spurious oscillations when modelling systems with strongly advective behavior, is free of numerical dispersion and also avoids the artificial mixing that affects reactive transport. Finally, it is easily parallelized and benefits from massive acceleration when implemented on GPUs. We will introduce the technique and discuss a number of research case studies that illustrate its utility.

Originally from Canada, I have been on the faculty of the Zuckerberg Institute for Water Research at BGU since 2018. My primary research leverages computational techniques and applied mathematics to study the effects of heterogeneity on subsurface flow and transport, and to deal intelligently with extreme uncertainty. I am particularly interested in developing computational tools that embody my research ideas and which can be used by others to advance the state of the art.