



**Tuesday 2 May 2023**

Onsite: h.16 - Aula Ruffini, *Dipartimento di Scienze della Terra, Torino*

Remote: [via webex at this LINK](#)

# Applications of numerical modelling in groundwater systems: from groundwater flownets and contaminant mass transport to water well protection

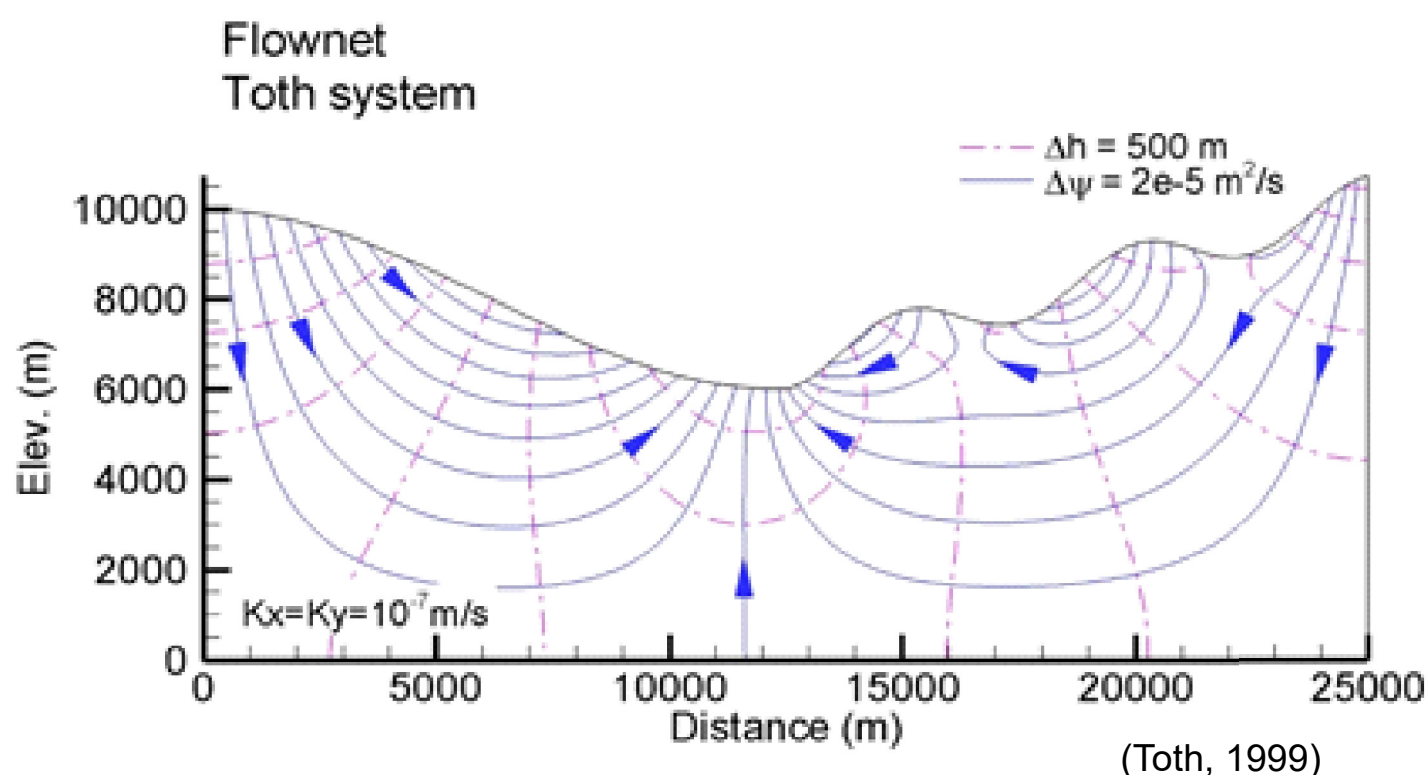
**Prof. John Molson**

*Université Laval, Québec, QC*



Numerical simulations of groundwater flow and reactive mass transport are presented for illustrating how numerical modelling can help provide useful insight into hydrogeological system behavior. Simulations are based on 2D and 3D conceptual models including porous and fractured porous media. Examples will include groundwater flow in regional-scale flow systems, transport and biodegradation of hydrocarbons, and simulations of capture zones for water supply wells.

One focus of the talk will be on numerically-simulated flownets which are a relatively fast and simple way to visualize flow systems and to test conceptual models by providing coupled solutions of hydraulic heads and streamlines. Advective travel paths and travel times are also obtained. The basics of setting up a model will be explained and flownets will be presented for various scenarios of homogeneous, heterogeneous and anisotropic flow systems. The Flonet model is available free for research applications.



## The Speaker

Dr. Molson is a Professor in the Department of Geology & Geological Engineering at Université Laval, Quebec City, Canada. His research focuses on the development and application of advanced numerical models for simulating coupled hydrogeological processes including groundwater flow and reactive mass transport, for defining capture zones for water supply wells, and for simulating heat transport in porous and fractured porous media. Dr. Molson is an Associate Editor for Hydrogeology Journal and for Grundwasser. He teaches courses in environmental hydrogeology and numerical modelling.

