RESEARCH INTERESTS AND PROFESSIONAL EXPERTISE

Modeling, measurement and interpretation of mass and energy flow and transformation in porous media; *in situ* characterization of soil hydraulic and mechanical properties; development of electromagnetic techniques for characterization of earth materials (geophysics); modeling and measurement of soil structural dynamics affecting hydraulic properties; modeling interfacial pore scale processes affecting liquid organization and behavior in porous media; analytical and lattice Boltzmann methods for modeling intermittent and unstable flows in fractured rock and structured media; liquid behavior is porous media under reduced gravity for space exploration; quantitative tools to study physical constraints affecting biological activity in the vadose zone.