Establishing a Quantitative Functional Relationship Between Capillary Pressure, Saturation and Interfacial Area

Project ID: 54793

Dr. Carlo D. Montemagno, Cornell University

Research Objectives

Through an integrated and focused research program that is comprised of theoretical, computational and experimental efforts this research effort is directed at: (1) improving on newly developed laboratory techniques to quantify and directly measure the functional relationship between phase interfacial area (a), saturation (S) and capillary pressure (Pc); (2) developing new computational algorithms in conjunction with laboratory measurements to predict Pc, S, and a; (3) testing exciting theory and developing new theory to describe the relationship between P{sub c}, S and a at the large scale; and (4) synthesizing the results of the experimental, computational and theoretical investigative efforts to develop a genetic model based upon an intrinsic soil metric to describe the functional dependence of Pc, S, and a. The results of this research could be used to generate a site specific soil moisture characteristic surface. Ultimately the results of this research could serve as the foundation upon which the true health and safety risk of site could be evaluated, the applicability of various remediation technologies examined, and the performance of implemented treatment strategies controlled.