PHYSICAL MATHEMATICS SEMINAR

EXTENDED CHARGE ELECTRO-OSMOSIS AND ELECTRO-CONVECTIVE INSTABILITY

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ABSTRACT:

We are concerned with one-dimensional electric conduction from an electrolyte solution into a charge selective solid, such as an ion exchange membrane or an electrode. It turns out that such conduction is generally stable, unless, due to diffusion limitation, the interface electrolyte concentration approaches zero. When this happens, the diffuse part of the electric double layer changes from its quasi-equilibrium structure to a different, non-equilibrium. The key feature of this new structure is an extended space charge added to the usual one of the quasi-equilibrium electric double layer. The non-equilibrium electro-osmosis related to this extended space charge renders the quiescent conductance unstable.

TUESDAY, OCTOBER 3, 2006
2:30 PM
Building 4, Room 270

Refreshments at 3:30 PM in Building 2, Room 349
(Applied Math Common Room)