

MAE Departmental Seminar
Friday 27 Oct. at 3:30 pm
Broughton Hall 3216

Double Diffusive Convection in Partially Porous Enclosures

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The presentation deals with natural convection driven by combined thermal and solutal buoyancy forces in a binary fluid. The configuration under study is a confined enclosure partially filled with a porous layer. In a first part, the study deals with vertical enclosures. The mathematical description of the problem is based on a one-domain formulation of the conservation equations. The numerical results show the influence of the porous layer characteristics on the flow structure and on heat and species transfer in the enclosure.

The second part of the presentation is focused on the stability of the horizontal layer. We analyze the consequence on the results of the mathematical formulation of the problem: one domain model vs. two-domain model using either the Darcy or the Darcy-Brinkman equations, associated to different interface conditions.