

**Near-critical Point Hydrodynamics and Microgravity****Daniel A. Beysens***CEA, Service des Basses Températures, Grenoble, France*

Near their critical point, fluids exhibit anomalous behavior of thermodynamic parameters (divergence of specific heat, compressibility and expansion coefficients) and transport coefficients (heat conductivity, thermal diffusivity). It results in a very particular hydrodynamics where in earth gravity field the fluid is extremely sensitive to even minute temperature gradients. I will emphasize here two examples where weightlessness experiments play a key role in revealing phenomena hidden on earth by convection and sedimentation. One is a very fast thermalization effect ("piston effect") where a thermal boundary layer expands and adiabatically heats the whole fluid. Critical slowing down and microgravity are also used to investigate the dynamics of phase separation with no gravity-induced sedimentation. The key role of the coalescence of domains makes valid only two growth laws. Their occurrence depend only on the gas and liquid volume fraction. This universality permits to successfully apply these evolution laws to a well-known biological problem: the sorting of embryonic cells.

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