Huseyin Merdan
Department of Mathematics
University of Pittsburgh

Renormalization group methods and regimes in interface problems

In this talk, we will discuss the temporal evolution of an interface separating two phases for its large time behavior. The calculation involves adaptation of methodology known in the physics literature as renormalization group and scaling theory.

We will consider a two-phased model in the quasi-static regime. Using renormalization group methods we will show that the characteristic length, $R(t)$, varies as $t^{(} - 1/lambda)$ while the total surface area of the interface, $S(t)$, varies as $t^{(}(1-d)/lambda)$ where $-3 < \lambda <= -2$, and the capillarity length arising from surface tension is irrelevant to the scaling of the large scale behavior even though it is a crucial factor for the initial growth velocity and the linear stability of the interface. At the end, the results will be compared with those of Jasnow and Vinals, and Caginalp.