Meeting: 999, Nashville, Tennessee, SS 11A, Special Session on Nonlinear Partial Differential Equations and Applications

999-35-61 **Gunduz Caginalp*** (caginalp@pitt.edu), University of Pittsburgh, Department of Mathematics, 507 Thackeray Hall, Pittsburgh, PA 15260. *Renormalization And Scaling In Interface Problems.*

Renormalization and scaling methods have been extremely successful in physics. Using methodology that is philosophically similar to these, we study asymptotically self-similar interfaces arising from solidification problems. In particular, we can determine the exponent q in R(t)˜tˆq, where R(t) is the single length scale in the interface for large time, t. One of the interesting consequences of this work is that the capillarity length (that is associate with surface tension) is "irrelevant" for large time, in sharp contrast with its pivotal role in initial stability. The methodology appears to be quite general and can be implemented for a range of applied mathematical problems. (Received August 02, 2004)