



# Pattern Formation In Diffusion-limited Crystal Growth: Beyond The Single Dendrite

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This book reviews the current state of the theory of pattern formation by a liquid-solid interface during crystal growth. It gives a pedagogical introduction to the subject, including experimental results, mathematical modeling and linear stability analysis. After highlighting the success of the theory in resolving the selection problem of dendritic growth, various new directions of research are presented in which progress has been made recently. These are the formation of nondendritic seaweed-like structures, growth of lamellar eutectics and rapid solidification. The interplay between analytic methods on the one hand (scaling arguments, asymptotic analysis, similarity equation, Sivashinsky singular expansion) and numerical calculations on the other (Newton method, dynamical schemes) is emphasized.

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