

Wetting in multiphase systems using the phase boundary method.

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Description:

The phase separation (or spinodal decomposition) is an ubiquitous mechanism in material science. It leads to the separation in two phases of an initially homogeneous mixture when it is cooled down. It is well described by simple partial differential equations such as the Cahn-Hilliard equation for which the interface between the two phases has a finite thickness. However, the description of the wetting properties when using the CH model is still difficult. Many possibilities have been explored but none is fully satisfactory.

The aim of the internship will be to propose a diffuse boundary model that allows to properly describe both wetting properties and transport at the boundaries. To this purpose an auxiliary field will be used and act as a third phase that is stationary. The aim of the internship will be to understand how model parameters should be chosen to have arbitrary surface energies and a proper description of the no-flux condition at the boundary.

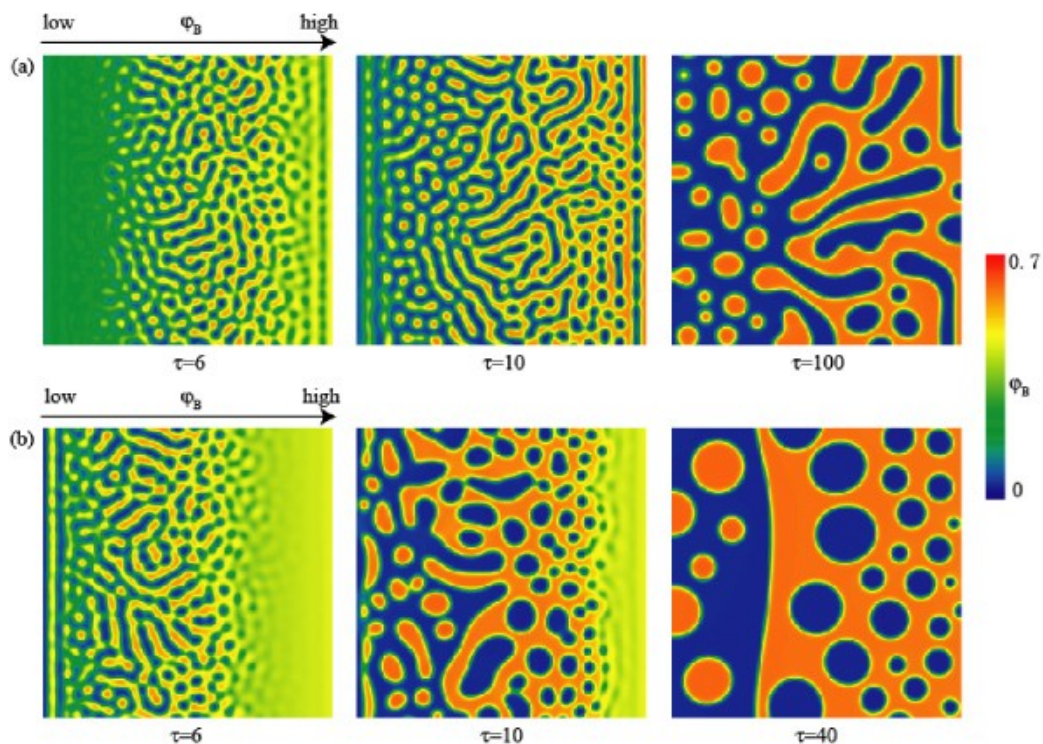


Figure 1: Typical patterns observed during phase separation