A Mesoscale approach to structural transformations

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The mesoscale approach to describing the behaviour of ferroelastics, such as martensites and ferroelectrics, is based on the use of a Landau description in terms of symmetry allowed strains and shuffles as order parameters. In this continuum description, the competition between the homogeneous free energy and that due to compatibility forces results in equilibrium and metastable microstructures. I will illustrate the use of this approach in understanding the behavior of interfaces and patterning at the nanoscale, including the role of fringing fields and size effects on microstructure.