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Autore	Dolzmann Georg
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Sommario/riassunto	Phase transformations in solids typically lead to surprising mechanical behaviour with far reaching technological applications. The

mathematical modeling of these transformations in the late 80s initiated a new field of research in applied mathematics, often referred to as mathematical materials science, with deep connections to the calculus of variations and the theory of partial differential equations. This volume gives a brief introduction to the essential physical background, in particular for shape memory alloys and a special class of polymers (nematic elastomers). Then the underlying mathematical concepts are presented with a strong emphasis on the importance of quasiconvex hulls of sets for experiments, analytical approaches, and numerical simulations.