

Special Issue

Deformation and Transformation Twinning

Message from the Guest Editor

Deformation twinning is a stress-induced lattice distortion that transforms a crystal into another crystal of same phase but with a different orientation. Some twins are associated with abnormally low Schmid factors, or are of pure stretch type (“zero-shear”), which challenges the classical theories. The nature of transformation twinning is different. Transformation twins are actually variants generated by a phase transformation, and the twin law results from the broken parent symmetries. This indirect relation between the twins may be confusing, and one may think that a variant can be transformed into another variant via the usual (shear) deformation twinning mechanism. This assumption is the cornerstone of the phenomenological theory of martensitic crystallography (PTMC) to explain the shape memory effect. However, there is no direct evidence that shows that such a simple shear mechanism is the correct one. A lot of important questions remain open. All contributions are welcome in this Special Issue, including critical and constructive reviews, new surprising experimental results, even if not yet fully understood and interpreted, etc.

Guest Editor

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Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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