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Creep and High Temperature Deformation of Metals and Alloys

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Message from the Guest Editors

The occurrence of time-dependent deformation of metals and alloys under constant loads or stresses, a phenomenon termed “creep”, has been documented for at least two centuries. Yet, its real significance was appreciated only by the late 1940s, when some peculiar features of creep were investigated in detail. The continuous development of dislocation theories later permitted to enlighten some specific features of creep deformation. Similarly, the same dislocation theories were used to provide a physical background to the study of metals and alloys response to hot working processes and also to explain and model stress relaxation effects. In parallel, many new creep-resistant materials have been developed, and new hot-working techniques introduced, but creep and hot-working studies proceeded, in most cases, independently of each other. Yet, in many cases, the mechanisms that control these phenomena are essentially the same.

The aim of this Special Issue is to collect research papers dealing on specific aspects of creep and high-temperature deformation or describing the response of metals and alloys by experimental techniques and/or modelling.

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Message from the Editorial Board

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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