Special Issue

Metallic Thin Films: Microstructure and Property Design

Message from the Guest Editors

Metallic thin films are one of the key components of modern electronic devices and therefore are the subject of substantial attention in research and technology. An outstanding combination of the physical and mechanical properties of metallic thin films originate from their nano-sized grain morphology and the high sensitivity of the film microstructure to production conditions. These factors and modern thin film manufacturing techniques facilitate the control over the film microstructure, enable the design of new metallic thin film systems and allow their optimization with the purpose of meeting the demands of specific applications. An important aspect of thin film material design is to control the film microstructure and phase stabilities during processing and device fabrication. Temperature and stress-induced grain growth, phase transformations, oxidation and cracking/delamination manifest microstructure instability and are the subject of extensive studies. Moreover, a particular interest of this special issue is the complex characterization of the film phase and microstructure evolution with highest possible resolution and with a focus on in-operando studies.

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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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