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Strengthening Mechanisms of Metals and Alloys

Guest Editor:

Dr. Marta Cabeza Simo
Senior Lecturer, Department of Materials Science and Engineering, University of Vigo, 36310 Vigo, Spain

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Message from the Guest Editor

For many years, the goal of materials engineering has been to increase the strength of metals and alloys. Meeting this objective generally entails a reduction in toughness. The challenge, nowadays, is developing strategies to improve both properties or, at least, to produce a moderate effect in improving fracture resistance. For this, a good knowledge of the strengthening mechanisms in different metals and alloys is required. This Special Issue of *Metals* focuses on various aspects of advanced research toward understanding the following aspects of strengthening mechanisms:

- Their role in innovative processing routes for manufacture of structural components;
- The importance of alloy design in determining efficacy;
- The role of nanoparticles in MMCs reinforced by different process routes;
- Microstructural characterization techniques;
- How the different strengthening mechanisms affect the surface properties of metals and alloys;
- Simulation and modeling;
- Strengthening against high-temperature deformation (creep) and against fatigue.

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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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Contact Us

Metals Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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