



Multiphysics and Multilevel Modeling of Composition Formation and Properties of Multicomponent and Polycrystalline Materials

Guest Editors:

**Prof. Dr. Anna Georgievna
Knyazeva**

Institute of Strength Physics and
Materials Science, Siberian
Branch, Russian Academy of
Sciences, 634021 Tomsk, Russia

**Prof. Dr. Peter Valentinovich
Trusov**

Mathematical Simulation of
Systems and Processes, Perm
National Research Polytechnic
University, 614990 Perm, Russia

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Message from the Guest Editors

Modern technologies for the synthesis of new materials (multicomponent and polycrystalline) are very diverse and are characterized by multifactoriality, non-equilibrium, and multistage. For their development and optimization, detailed studies of a variety of related phenomena, their interaction and influence on synthesis dynamics are required. Experimental study of the composition and structure of synthesized materials is carried out after additional influences and manipulations, which does not always give an idea of the physical processes that led to this or that result. Help can come in the form of mathematical modeling, which currently has a wide range of possibilities from studying processes on the atomic and molecular scale to describing the process as a whole. A good mathematical model should not only describe what is observed, but also have predictive properties. Ideally, the model should tell us what technological conditions are necessary to obtain a material of a given composition and structure, and required to improve the performance characteristics of the product created from this material.





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Editor-in-Chief

Prof. Dr. Maryam Tabrizian

1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada

2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

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Materials Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

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