



Microstructure Change and Mechanism during the Metal Machining Process, Modeling, and Applications

Guest Editors:

Dr. Yixuan Feng

Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA

Dr. Man Zhao

School of Mechanical and Automotive Engineering, Shanghai University of Engineering and Science, Shanghai 201620, China

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Message from the Guest Editors

Machining parameters, tool geometries, and metal microstructure all have significant effects on the dynamics of velocity, deformation, stress, and temperature in shear zone. The physics-based analysis and predictive model on shear straining, thermal kinematics, and material constitutive relation can help to comprehend the coupling effects between thermal and mechanical loadings and the related materials behavior evolutions. Metal microstructure changes in machining include recrystallization, grain growth, crystallization evolution, and phase transformation. The machining process is significantly influenced by the material microstructure as the tool cutting through grain boundaries. In return, microstructure of metal keeps changing during the machining process. Therefore, the microstructure changes and machining process are affected iteratively. It is necessary to understand this mechanism to better predict the machining process.

For this Special Issue in *Metals*, we welcome reviews and articles regarding modeling and applications of microstructure change and mechanism during the metal machining process.





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Department of Materials Science
and Engineering, College of
Engineering & Applied Science,
University of Wisconsin-
Milwaukee, 3200 N. Cramer
Street, Milwaukee, WI 53211, USA

Prof. Dr. Yong Zhang

Beijing Advanced Innovation
Center of Materials Genome
Engineering, State Key
Laboratory for Advanced Metals
and Materials, University of
Science and Technology Beijing,
30 Xueyuan Road, Beijing 100083,
China

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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MDPI, St. Alban-Anlage 26
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