

Crystal Plasticity (Volume II)

Wojciech Polkowski 

Lukasiewicz Research Network, Krakow Institute of Technology, Zakopiańska 73 Str., 30-418 Krakow, Poland; wojciech.polkowski@kit.lukasiewicz.gov.pl; Tel.: +48-12-26-18-115

1. Introduction

When we announced the first volume of a Special Issue dedicated to “Crystal Plasticity”, we could not expect that a great collection of 25 excellent articles would be published [1]. Now, everyone is very welcome to use free access to read these articles at the link below:

https://www.mdpi.com/journal/crystals/special_issues/Crystal_Plasticity (accessed on 18 September 2022).

Our editorial efforts taken in the first volume provided us with a completely new collection of original, state-of-the-art research papers on both theoretical and experimental aspects of plastic deformation. Indeed, the wide spectrum of submitted papers allowed us to merge the most important topic areas of crystal plasticity—i.e., research on the theoretical modelling of dislocation mechanisms and lab-scale validation of materials’ structural/mechanical responses to (semi-)industrial processing. Furthermore, both conventional (e.g., steels, nonferrous alloys) and novel (intermetallics, composites, and high-entropy alloys) materials were investigated. During the completion of the first volume, it was our honor to host well-recognized worldwide authorities, as well as young researchers and post-docs taking the “next-step” in their scientific careers. This versatility of contributing authors and topics has provided more proof for the high interest of the scientific community in revealing materials’ behaviors from the atomic scale to macroscale under external loadings.

After closing the first volume, we had the feeling that there was still a lot of room for research in the field of crystal plasticity, and thus a lot of space for publishing activities . . . Therefore, we had no doubts in announcing the second volume of a Special Issue on crystal plasticity. With the second volume, we aimed to continue our mission, which is still focused on providing theoretical and experimental research works, giving new insights and practical findings in the field of crystal plasticity-related topics.

So, how is the second volume on crystal plasticity? We can answer by paraphrasing a well-known song: “*Oops . . . we did it again*”.

Once again, a completely new set of 26 original works (including 22 research articles, 3 communications and 1 review) has been collected. As in the case of the first volume, here, a full spectrum of topics belonging to the field of crystal plasticity is represented, including both numerical simulations and experimental works.

By taking into account the investigated materials, the papers can be assigned to the following thematic groups:

- Steels and iron-based alloys [2–9];
- Non-ferrous alloys with fcc- (Ni- [10,11] and Cu-based [12–14]), or hcp crystal structure (Mg- [15,16] and Ti-based [17,18]). Other examples include Zirconium [19], Bi-Sn alloy [20] or polycarbonate resins [21];
- Multicomponent and high-entropy alloys [22–24];
- General theoretical studies on crystal plasticity [25–27].



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I hope that the second volume of our Special Issue will be interesting for the scientific and academic communities, and that it will bring lot of inspiration for future research activities in the field of crystal plasticity.

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