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X-ray and neutron Line Profile Analysis of Microstructures

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Message from the Guest Editors

Dear Colleagues,

X-ray and neutron line profile analysis proves to be an ever more powerful method to reveal many different quantitative aspects of microstructure properties in crystalline materials. It has become one of the most widely used complementary tools to electron microscopy for characterizing microstructures of materials. Functional properties of crystalline materials are determined by both the crystal structure and the imperfectness of crystal structure, where imperfectness comprises of a large variety of lattice defects. When the crystal lattice becomes imperfect diffraction peaks broaden and the kind and type of broadening also reveals great variety. Coherently scattering domains gives size broadening, dislocations, intergranular strains, thermal anisotropy in non-cubic crystals or misfit between matrix and second-phase particles produce strain broadening, planar defects of different kinds make peaks shift and broaden, chemical inhomogeneities on different scales produce specific peak shifts and shapes.

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Message from the Editor-in-Chief

Welcome to *Crystals*, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies. Through *Crystals*, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the *Crystals*, where science merges with beauty and innovation.

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