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Nonclassical Nucleation—Role of Metastable Intermediate Phase on Crystal Nucleation

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Message from the Guest Editors

Classical nucleation theory (CNT), which was established about 90 years ago, has been very successful in many research fields, and continues to be the most commonly used theory in describing the nucleation process.

Recently, computer simulations and theory have revealed nonclassical features in the early stage of nucleation. In particular, the decoupling of order parameters involved during a fluid-to-solid transition leads to the so-called two-step nucleation mechanism, in which a metastable intermediate phase (MIP) exists between the initial supersaturated solution and the final crystals.

In this Topic, we focus on the role of the various MIPs on the early stage of crystal nucleation. Such MIPs have been observed in organic materials, minerals, colloids and proteins, resulting in various scenarios of nonclassical pathways of crystallization. Efforts are required on the characterization of the structural and dynamical properties of MIPs, the growth kinetics of both MIPs and crystals, as well as the theoretical understanding of the decoupling of order parameters.

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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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